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Five-, Ten-, and Twenty-Five-Year Improvement Programs

IT cannot be supposed that the "happy thought" method of planning municipal programs will ever become wholly extinct. Impulse and emotion play too important a part in human life to disappear entirely, either in the shadow of caution or in the bright light of intelligent progress. But, fortunately for the welfare of our cities, impulse and emotion in municipal development are calling to their aid, more and more, the modern science of city planning. Happy thoughts are finding guidance in forethoughts.

This long-time planning is now, on its part, being made more practical and effective by step-by-step programs of accomplishment. Such program-making involves a careful analysis, on the part of municipal officials and civic bodies, of the comparative importance and urgency of the various projects proposed, and of the possibility of financing them. As specific examples of this growing movement, Bluefield's five-year program and the ten-year programs of Dayton and Kansas City have already been mentioned in these columns. Recent evidences of the spread of the idea of planning ahead for a definite term of years come from such widely separated cities as Dallas, Albany, N. Y., San Francisco, and Duluth.

In line with its city's slogan, "Dallas, Where Men Are Looking Forward," the Dallas Chamber of Commerce has named a committee to map out a program for the next twenty-five years. All phases of the city's development—industrial, commercial, civic and social—will be considered. Incidentally, the thorough manner in which the Dallas twenty-five-year Program Committee is going about its task is indicated by the fact that Chairman Frank McNeny has placed an order for twenty-five yearly subscriptions for THE AMERICAN CITY, one copy to be mailed each month to each of the committee members.

In Albany, N. Y., the Chamber of Commerce also is taking the lead, and a ten-year program of city planning and municipal improvements is being worked out. San Francisco, likewise, has adopted the decade as the unit, and City Engineer M. M. O'Shaughnessy is actively advocating his "Ten-Year Program of Civic Development" before the commercial and civic organizations of the city.

In Duluth the Taxpayers' League has issued "An Inventory of Proposed City Projects," on the front page of which three questions are asked: "What Do We Want? What Do We Need? What Can We Afford?" In the pamphlet are described thirty different projects which are being actively advocated by community clubs, civic organizations, trade associations and individuals, at a total estimated cost of over $38,000,000—approximately 30 per cent of the assessed valuation of the entire city. The Taxpayers' League points out that obviously such a program cannot be carried through to completion within the immediate future, and urges the citizens of Duluth "to consider the importance of each permanent improvement in relation to all projects; to realize the necessity of drawing up a ten- or fifteen-year permanent improvement program in the order of general community benefit; to bear in mind the financial ability of the community to pay the cost."

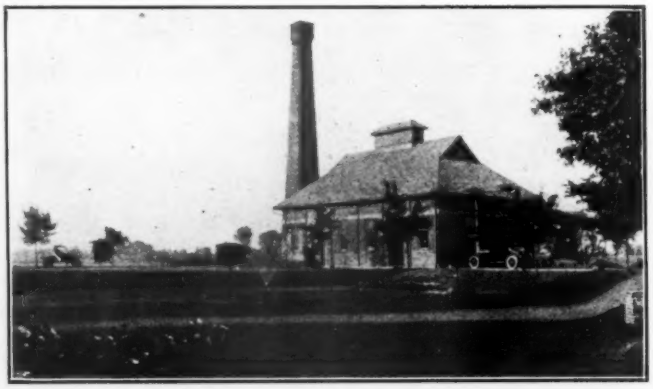
As a means of combating the unthinking hue and cry against municipal extravagance, and of providing for the construction of needed public works in some relationship to their real urgency, the five,- ten- or twenty-five-year program has great value.

The Removal of Iron from the Public Water-Supply of Shelby, Ohio

By Philip Burgess

Burgess and Niple, Engineers, Columbus, Ohio

THE public water-supply at Shelby, Ohio, was installed by the local water company in 1897 and was obtained without treatment from drilled wells extending about 50 feet into the drift bordering on Black Fork Creek. The supply proved unsatisfactory on account of its high iron content, and in 1905 the water company installed purification devices to remove the iron from the water. These devices included aeration by baffles in the top of the stand-pipe, followed by sedimentation in the stand-pipe and, finally, by filtration through two horizontal steel pressure filters, each 8 feet in diameter and 24 feet long. The filtering material comprised coarse crushed quartz 18 inches deep. These devices proved fairly satisfactory, and the iron was reduced from approximately 7 parts to about 0.6 part per million.



PUMPING-STATION OF THE SHELBY, OHIO, WATER-WORKS

Subsequently, when the water consumption at Shelby increased from 300,000 gallons daily to about 700,000 gallons daily, or over double the supply obtained during the year 1905, the removal of iron by the purification devices was not at all satisfactory, and the writer was retained by the water company to design a new iron-removal plant. Subsequently his firm entered into a contract in 1919 to construct this plant in accordance with the design furnished.

Features of New Removal Plant

The general features adopted in the new purification plant were similar to those in the old plant and comprised aeration, sedimentation or coagulation, and filtration through rapid sand filters of the open, or gravity, type. At about the same time the source of supply was changed from the old drilled wells to two new dug wells, each approximately 45 feet deep. The nominal capacity of the new plant is 1,000,000 gallons daily.

Water is pumped from the new wells by motor-driven centrifugal pumps, which discharge the water through perforated horizontal pipes and distribute it over the tops of the aerators, which are based upon a nominal capacity of 17 gallons per square foot per minute. The aerator is composed of three horizontal trays, each containing coarse coke. The trays are 12 inches deep, with 12-inch open spaces between the trays. The bottoms of the trays are covered by wire screens containing 3½ meshes per inch and composed of iron wire 0.105 inch in diameter. The 12-inch coke layers are composed of particles ranging in size from ½- to 3-inch diameter. Each tray is 4.5 x 9 feet in section with a total area of 40.5 square feet. The aerator is located over one end of the coagulating or settling basin.

The aerated water falls by gravity into one end of the coagulating basin, which is an uncovered tank of reinforced concrete construction 14 x 43 x 10.5 feet deep, holding 47,300 gallons. The nominal period of retention in the basin is about one hour.

The coagulated water flows by gravity to two open gravity rapid sand filters, each containing 240 square feet of sand area. The filters are designed to operate at a nominal rate of 100,000,000 gallons per acre daily, or somewhat less than the nominal rate usually adopted for rapid sand filters treating surface water-supplies. The strainer systems of the filters comprise 10-inch cast-iron main collectors and 1½-inch galvanized-iron late-

rals, spaced 6 inches apart and perforated with six ¼-inch round holes per lineal foot. Over the strainer system is placed 12 inches of filter gravel comprising particles ranging from 1/12 to 2 inches in diameter. Above the gravel is placed 2 feet of filter sand, which has an effective size of 0.49 millimeters.

The filters are washed from a 10-inch connection to the stand-pipe, and the rate of application of the wash water is from 20 to 24 inches rise per minute. The tops of the wash-water troughs are 24 inches above the filter sand.

The filtered water discharges by gravity into the clear well below. This is of reinforced concrete construction and holds about 250,000 gallons. The filters and operating gallery are covered with a substantial brick superstructure.

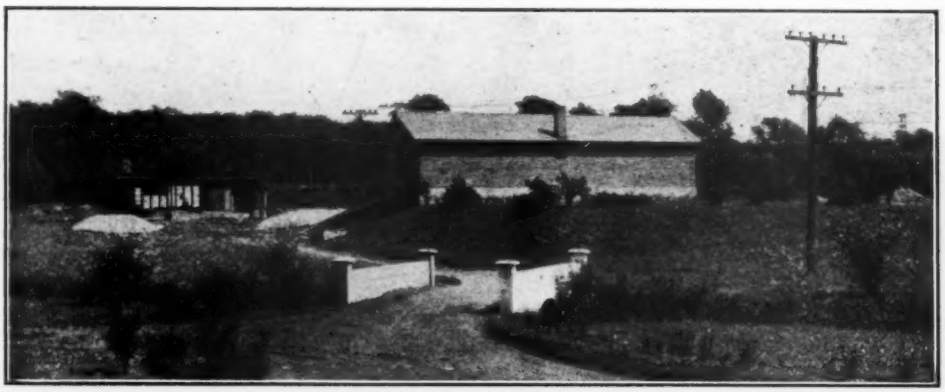
The new iron-removal plant at Shelby was placed in operation on March 19, 1920, and it has continued to give satisfactory results since that time. It is of interest to note that the very first water treated in the plant came through clear and sparkling. The iron content of the raw water ranges in well No. 1 from 14 to 16 parts per million and in well No. 2 from 6 to 8 parts per million. The untreated water contains from 40 to 50 parts of free carbonic acid and no dissolved oxygen. The aerated water contains from 20 to 30 parts of free carbonic acid, and generally is about 65 per cent saturated with dissolved oxygen. The filtered water generally contains from 10 to 15 parts of free carbonic acid and from 0 to 0.3 part of dissolved iron.

Experience with the continued operation of the plant indicates that the aerator performs a very essential part of the purification process. It is necessary from time to time to clean the contact material of the aerator, as this tends to become clogged with iron sludge. When the aerator is dirty the water is not distributed over the trays and is not properly aerated, with the result that a heavy burden is placed upon the filters, with a material reduction in the elimination of the iron. Poor operation of the aerator is readily noticeable by the green color of the water in the coagulating or settling basin. Under good operating conditions, the treated water is, of course, red.

THE STAND-PIPE OF THE SHELBY, OHIO, WATER-WORKS

Desirable Changes Based on Experience

Experience indicates, also, that considerable sludge is removed by the settling basin, although doubtless a large percentage of this



THE FILTRATION PLANT

sludge is washed through from the aerator. The writer believes that proper operation would be more readily obtained if the aerator were made of larger area and designed on a rate of about 10 gallons per square foot per minute instead of 17 gallons per square foot, as used in the original design. In general, the results secured by the plant are very satisfactory when proper aeration is obtained, but are not satisfactory when the aerators are neglected or clogged.

Experience indicates also that somewhat deeper gravel layers should be provided in the filters, as the 12 inches available is not sufficient to prevent the moving of the gravel during continued washings of the filters.

The water consumers at Shelby have been very much pleased with the results accomplished by the plant, and, in fact, the company has been able to secure a material advance in rates on account of the improved service rendered and on account of the satisfactory character of the water-supply provided by the new plant.

Another feature of interest is the fact that the considerable iron content in the supply previously delivered into the mains and services was sufficient to cause many complaints by the clogging of service lines and by the stoppage of meters. These difficulties have been practically eliminated by removing the iron from the water-supply. This, of course, benefits the water company as well as the consumer and promotes much more desirable relations between the company and its customers. In general, these improved relations have resulted in an increased income and benefits to the company and in an increased enjoyment in the use of the public water-supply by the customers. The benefits derived from the new plant have more than compensated the company for the expense entailed by its construction, which amounted to about $35,000.

Improvements in the Water-Works Power-Plant, Dubuque, Iowa

By L. J. Jellison

BY a vote of almost four to one in 1923 the city of Dubuque, Iowa, carried a $325,000 water-works bond issue which is paying for improvements in the water-works system. Among the most important improvements will be a fire-proof structure for the city pumping equipment on which the water-supply for the entire city depends. This will remove the now ever-present danger of the city's being completely shut off from its supply of water by a fire which at any time might destroy or damage the pumping-station of the water-works.

The present four boilers, three of which are practically unfit for longer service, will be augmented by two 400-horse-power electric motors, and there will be installed an 7,500,000-gallon centrifugal pump, two air compressors with a capacity of 2,500 cubic feet of air per minute for the operation of air lift and to increase the output of the artesian wells from 1,000,000 to approximately 5,000,000 gallons daily.

The New Pumping-Station

The new pumping-station and power-plant built for the city water-works at the Eagle Point station is strictly fire-proof and modern in every respect. The building is divided into two parts, a pump room and an auxiliary pump room, separated by a heavy brick fire-wall. The size of the auxiliary pump room is 99 feet 9 inches by 57 feet 4 inches, and 45 feet in height between the floor level and the underside of the roof truss. The roof truss is of steel covered with fire-proof tile. The pump room is 142 feet 6 inches by 59 feet 6 inches and 26 feet between the floor level and the underside of the roof truss, which is also steel and covered with tile, the walls being of brick and concrete.

All window-frames are made fire-proof by the use of steel frames and sash. The floors are made of reinforced concrete. The present 250-horse-power water-tube boiler is attached to the new battery, making a power-plant of 950 horse-power.

Some Good from the Housing Shortage

New Construction Methods and Salvage of Old Dwellings

By Bernard J. Newman
Managing Director, Philadelphia Housing Association

THE cities of the world are in a hectic state because of the high cost of dwelling construction, with the resultant inability to build sufficient housing accommodations to provide for their normal population growth. European cities, in spite of their experiments with municipal housing and rent control, still have excessive congestion with a high percentage of one-room occupancy. Comparatively few American cities felt the pressure of housing needs until recent years, but now the housing shortage is universal. The nation needs about 1,000,000 more homes. Dwelling construction now under way is too expensive for the average citizen, while practically no houses are being built for the small-wage earners. This shortage of homes is giving speculators a chance to exploit renters, and in almost every community loud protests are being voiced against high rents. Furthermore, while there is a tendency toward stabilization of commodity prices, though on a higher level than in 1914, in the field of housing rents have not yet reached their peak.

This situation constitutes an emergency, unsettling social relationships and disturbing industrial conditions. Perhaps it is not an unmixed evil, since it is challenging public attention and stimulating plans to simplify construction detail. It is actually forcing the building industry to think in terms of cost-cutting and to adopt labor-saving devices. Thus, greater standardization of parts, such as the sizes of bricks and of concrete blocks, of locks, door and window frames, plumbing piping, traps and fixtures, is becoming popular. Greater use is being made of materials in new forms, such as machine-made plaster board. Mass production of dwellings, with the application of engineering methods and the attraction of engineering talent, is taking the place of the old rule-of-thumb practice that has so long prevailed. These are evidences of a gain being forced by the abnormal housing situation and the high material and labor costs of construction.

But there is another gain in the economy of use of dwellings. The cities of the United States have been prodigal in their use of buildings. Neighborhood changes have been invited by lack of control over the use to which dwellings have been put, and these changes have caused vacancies, with a wasteful non-use of structurally sound houses, while owners have waited for new uses to come into their neighborhoods. There have been unnecessary delays in the renovation or replacement of outgrown structures, and there has also been some premature scrapping of old houses. More serious has been the neglect to make repairs and to maintain conditions which encourage sanitation, with a pronounced trend toward congested occupancy, without the installation of sanitary improvements to modify the hazards of overcrowding.

It is notorious that the older cities of the country have been most at fault in these matters. Some, however, are now pointing the way whereby a higher percentage of use may be obtained from old buildings. They are demonstrating that the need for new housing may, in part, be met by the re-use of old houses. Philadelphia perhaps is typical in this respect. Those familiar with the layout of the older sections of the city know there are countless rear courts and alleys, some reclaimable and others that have literally deteriorated into dens of disease and iniquity. One typical court of nine houses occupied by fifteen families illustrates this latter group. During a three-year period, the local Housing Association found in the records of eleven welfare agencies dealing with these families, twelve cases of illegitimate children, three cases of brutality to children, two cases of incorrigible boys, one case of rape, two deserting husbands, nine deserting mothers, three habitual women drunkards, two habitual men drunkards, three mentally deficient children, four cases of tuberculosis, eight hospital cases, six cases of serious sickness among infants, and seven cases of poverty.

Renovations in Philadelphia

At various times groups of Philadelphians have experimented in the renovation of these old courts. The Henry Phipps Institute reclaimed one area in an experiment with home treatment of tuberculosis cases under conditions permitting adequate light and ventilation. As a social experiment in property man-

agement, the Octavia Hill Association has renovated several courts and alleys, and rented these properties to the low-rent-paying groups. But the relatively large number of such houses, near the center of the city, have been allowed to fall gradually into disrepair and to be occupied by tenants who have little, if any, conception of the value of house hygiene and sanitation.

Typical of this latter group were sixteen small brick houses on a minor street, 105 feet long and 18 feet wide, in the central part of the city, a block and a half from one of Philadelphia's most exclusive residential sections. These dwellings, which housed 87 people, were slatternly in appearance, with broken windows and loosely hanging shutters. The street was without a sewer, and none of the buildings had sanitary equipment. Their shallow yards were cluttered with unsightly outhouses, and rubbish was piled high. The street itself contained many depressions in which mud and surface drainage lay.

In 1922 a Philadelphia manufacturer conceived the idea of renovating this street. He was able to take title to both the street and the dwellings. The building laws would not permit new dwelling construction, because the street was too narrow and the lots too shallow. After the eviction of the tenants and the removal of their household goods, over fifty wagon loads of rubbish were cleaned from the cellars and the yards.

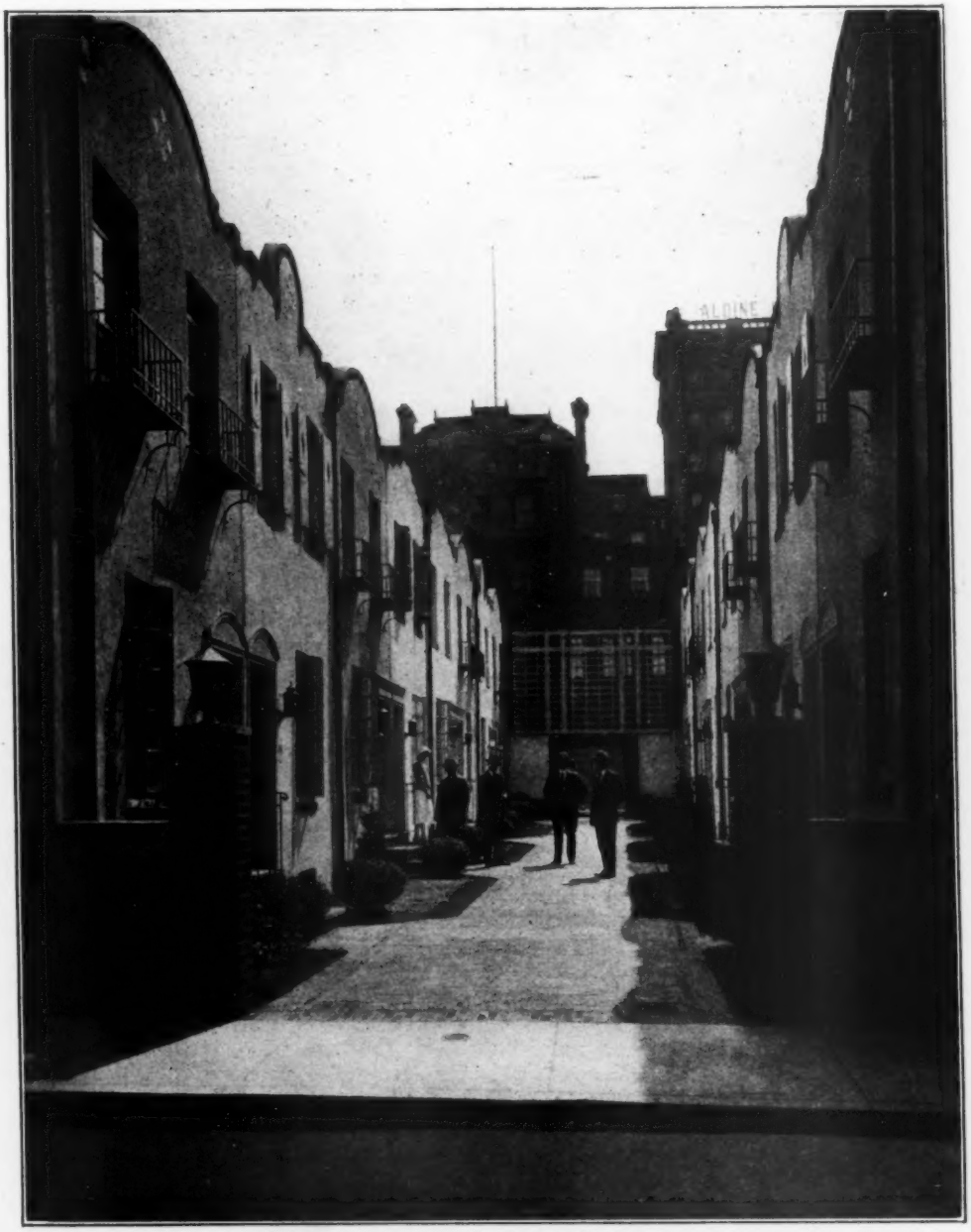
The houses were stripped to the walls, partitions and floors, and thoroughly disinfected. They were replastered, new trim was built in, hardwood floors were laid, and tiled bathrooms, complete sanitary equipment, electricity and a central heating plant were installed. Each house was converted into a little four-room apartment with a kitchenette, a common living and dining room and two bedrooms. The outside coating of white and buff stucco, with colored tile insets, gave the walls the appearance of new construction. Window shutters of bright color were hung; and iron balconies and rails similar to those used in Italian cities and craftsman lanterns gave to the whole an attractive and artistic appearance, in extreme contrast to the original drab look of the property. The street

UBER STREET, PHILADELPHIA, PRIOR TO RENOVATION

bed was changed to a walk, and the old sidewalks, converted into green grass plots with dwarf evergreens, enforced the contrast.

A Beneficial Demonstration

The houses are popular and profitable. The original rents of $12 have been increased to $100, $110, and $120. Janitor and maid service is furnished the tenants. What has developed here is practically a horizontal in place of a vertical apartment house, all families living on the ground floor with a privacy not obtainable in the modern apartment hotel. The owner has profited, but he has done more by his renovation. He has increased the assessed value of the property and of the land surrounding, and hence has increased the tax return received by the city. This manufacturer has demonstrated the possibilities of conversion, and he has further shown that there



UBER STREET, NOW LANTERN LANE, AFTER THE TRANSFORMATION

is a profitable field for the renovation specialist. This is evidenced by the fact that since Lantern Lane has been completed several similar renovations have taken place. One is known as Sansom Gardens; another, a demolition and reconstruction project, is known as the Old English Village; while a third, and the most elaborate, conversion is Panama Street, on the fringe of the fashionable Rittenhouse Square district. Here the entire street has been bought and converted from cheap dwellings and illegal tenements to high-grade, artistic residential homes. There can be no doubt that old properties near good neighborhoods may be rehabilitated with profit, and what has been done in Philadelphia may be duplicated in other cities having like conditions.

Relation of Roadway Widths and Transit Lines to Street Traffic

By Harland Bartholomew
City Plan Engineer, St. Louis, Mo.

ALL roadways for modern traffic should have widths based upon the number of lines of traffic to be accommodated. Failure to adapt paving designs to the changed demands of vehicles has cost many millions of dollars in taxpayers' money and has introduced unnecessary complications into the traffic problem. In one moderate-sized city of the Middle West, the City Engineer is still laying 30- and 40-foot pavements in residence districts when 26- and 36-foot widths would accommodate respectively three and four lines of vehicles just as well. In the last five years the excess pavement charge against that city is estimated at no less than $125,000. Excess pavement, while not of serious importance as far as traffic in residential districts is concerned, becomes a great annoyance in congested centers. It invites disregard of parking rules and is a frequent cause of traffic accidents. It also reduces sidewalk space unnecessarily. A roadway of excessive width which may actually be only wide enough for four lines of vehicles seems to be capable of carrying five or of accommodating parked cars at all angles to the curb. The uncertainty which results from such conditions hinders the enforcement of proper traffic rules.

Careful study of roadway widths in congested centers will frequently show that a slight change here and there either in parking rules or in the roadway itself will make an appreciable difference in the flow of traffic. The pavements in the business district of Chattanooga were not designed for angular parking, but practically every street was so used. Vehicular movement was seriously impeded and traffic conditions intolerable. Market Street, which carries a double-track car line and which should be a commodious six-line thoroughfare, was reduced to a two-line street, automobiles of all kinds and street cars using the line occupied by the rails. The institution of parallel parking has cleared the street-car right of way and opened up two new channels for other vehicles. Broad Street, in the same city, a 126-foot street, has a 96-foot roadway and is theoretically capable of carrying ten lines of vehicles. Unsystematic parking on sides and center, however, has reduced this street to a two-line thoroughfare. Chestnut Street, with a four-line roadway, because of careless angular parking, at times becomes so badly blocked that automobiles must be moved upon the sidewalks to clear the street.

These are cases in which roadways properly designed for certain uses become extremely inefficient through misuse. In the case of the Washington Avenue pavement in St. Louis, laid when the street was recently widened, it was found that a 50-foot roadway with double-track car line, while theoretically and actually capable of accommodating six lines of traffic, did so at such a loss of speed as to affect seriously the capacity of the street as a carrier. In order to reduce the hazard of passing between parked vehicles and street cars and thus to increase the traffic flow, the curbs were set back 3 feet on either side. The 56-foot pavement now passes approximately twice the number of vehicles per hour.

Improper Routing of Transit Lines

The improper routing of transit lines is a common source of trouble in congested centers. Left-hand turns are frequently made directly across the flow of traffic on the busiest street. The delays thus caused react unfavor-

STREET DESIGN

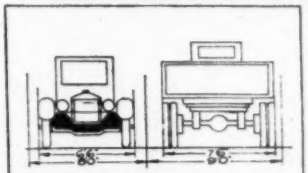
IN PLANNING NEW STREETS AND RECONSTRUCTING OLD ONES TO MEET REQUIREMENTS OF MODERN TRAFFIC OBSERVE THE FOLLOWING PRINCIPLES.

DEVELOP SYSTEM OF MAJOR STREETS - WIDE DIRECT THOROUGHFARES.
RELATE ALL STREETS TO TOPOGRAPHY SO THAT EASY GRADES MAY BE SECURED AND ALL STREET FRONTAGE MAY BE USED.
ASSIGN WIDTH TO STREETS ACCORDING TO VOLUME OF TRAFFIC THEY ARE TO BEAR.
BASE WIDTH ON NUMBER OF LINES OF MOVING AND STANDING VEHICLES ULTIMATELY TO BE ACCOMODATED.
ADJUST ROADWAY AND SIDEWALK PROPORTIONS OF EACH PARTICULAR STREET TO NORMAL DEMANDS.

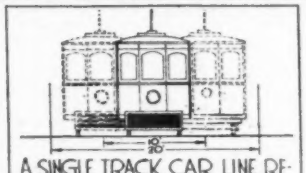
SEVERAL EXAMPLES ARE SHOWN BELOW TO ILLUSTRATE THE INTERRELATIONSHIP OF STREET AND ROADWAY WIDTHS AND TRAFFIC REGULATIONS.

IN ANALYZING THE DIAGRAMS IT SHOULD BE BORNE IN MIND THAT THE "STREET" IS THE ENTIRE SPACE BETWEEN PROPERTY LINES.

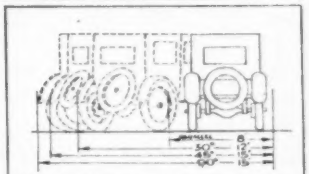
STANDARDS FOR ROADWAY DESIGN AND TRAFFIC REGULATION



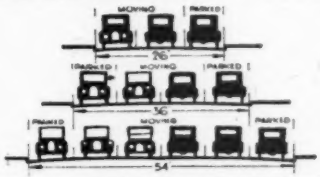
UNITS OF 8 AND 9 FEET SUFFICE FOR MOVING VEHICLES.



A SINGLE TRACK CAR LINE REQUIRES 10 FEET OF ROADWAY - A DOUBLE TRACK 20 FEET

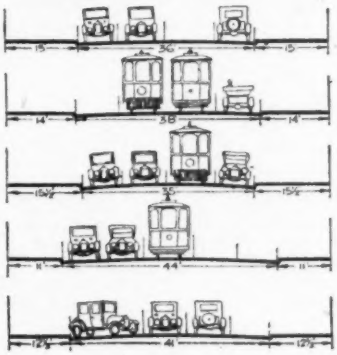


FOR PARKING ALLOW SPACE AS ABOVE - DRAW LINES ON PAVEMENT



A 3 LINE ROADWAY (26 FEET) IS STANDARD FOR QUIET RESIDENTIAL STREETS.
A MINOR STREET WITH SOME THROUGH TRAFFIC OR CONSIDERABLE PARKING SHOULD HAVE A 4 LINE ROADWAY (36 FEET) GREATER WIDTH OF ROADWAY IS GENERALLY WASTED UNLESS THE STREET IS MADE A FULL 6 LINE THOROUGHFARE WHICH REQUIRES A 54 FOOT PAVEMENT.

ECONOMICAL ROADWAYS FOR EXISTING 66 FOOT STREETS.



1. THE NORMAL DEVELOPMENT
FOUR LINES - PARKING PARALLEL TO CURB OR PROHIBITED ENTIRELY ROADWAY 36 FT SIDEWALKS 15 FT

2. WITH DOUBLE CAR TRACK
FOUR LINES - ALL MOVING - NO PARKING
ROADWAY 38 FEET, SIDEWALKS 14 FEET EACH

3. AS ABOVE ONE TRACK REMOVED
ONE WAY STREET - TWO LINES MOVING - PARALLEL PARKING ON EACH SIDE ROADWAY 33 FEET, SIDEWALKS 15½ FEET

4. SINGLE CAR TRACK IN CENTER
FIVE LINES TWO STANDING PARALLEL TO CURB - THREE MOVING ROADWAY 44 FEET, SIDEWALKS 11 FEET

5. VARIATION OF NUMBER ONE
ONE LINE PARKED AT 45° ONE LINE PARALLEL TWO MOVING ROADWAY 41 FEET, SIDEWALKS 12½ FEET

HARLAND BARTHOLOMEW
City Plan Engineer St Louis Mo 1923

ably upon all traffic on that street and upon cross-streets. A slight change in routing which would not inconvenience the riding public would entirely eliminate many of these left-hand turns at strategic points and bring the remainder at corners not so important.

In Toledo the transit routing plan prepared for the city proposed the removal of car lines from alternate parallel streets in the business districts, so that each type of carrier might have its own thoroughfare. The movement both of automobiles and of street cars through the congested center would thus be greatly facilitated. Such a separation of street-car and automobile routes is highly desirable and should be undertaken at every opportunity. It is practically impossible to make effective use of street space so long as the flow of traffic is unsystematic.

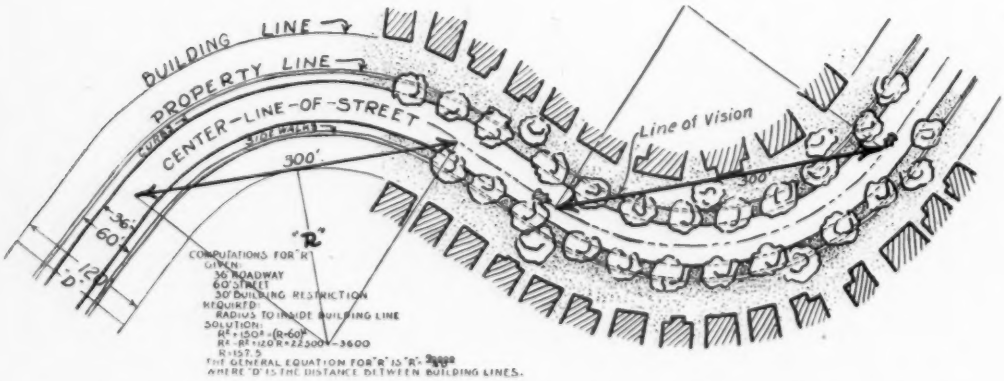
One great contributing factor in the problem of street congestion is the unscientific street plan possessed by most cities. Unsystematic routing of traffic is frequently due to the lack of suitable streets. The automobile seeks direct routes, and few of these are available in the average city. Even more difficult than the unscientific apportionment of roadway spaces in relation to lines of travel, is the unscientific width and arrangement of streets that might be expected to afford a satisfactory scheme of circulation in any given community. A study of the traffic problem even in small communities usually discloses certain street openings, cut-offs or widenings, often inexpensive, whereby new routes of travel might be opened that would afford considerable relief throughout the whole city. The development of a city plan is absolutely essential to any study of street congestion.

EDITORIAL NOTE.—A comparison of the roadway widths recommended by Mr. Bartholomew in his recent paper before the American Electric Railway Association, from which the foregoing paragraphs are quoted, and in the Street Design chart on page 475, discloses certain differences from the standards suggested by Hugh E. Young in his paper before the 1923 meeting of the National Conference on City Planning (see the Proceedings of the Conference, or the 1924 Municipal Index, page 279). Mr. Bartholomew, for example, advocates a width of 54 feet for a six-line thoroughfare without car tracks, whereas Mr. Young advocates a 56-foot width except for a street laid out without consideration for the autobus. In reply to an inquiry from THE AMERICAN CITY on this subject, Mr. Bartholomew writes:

"The large motor-bus is occupying considerable attention these days, and it is very well indeed to emphasize the need of planning roadways for such vehicles. Our work, however, is very largely in small cities where it would be manifestly unwise from several standpoints to advocate a general adoption of the 10-foot roadway unit. We prefer to advise these cities to use the 9-foot unit, unless it appears through major street and transit studies that certain thoroughfares are likely to carry either street car or motor-bus. For roadway planning purposes the requirements of these two forms of transportation would be considered identical.

"Our policy is to urge cities to give much more careful thought than they ordinarily do to the problems of street-car and bus routing, and to put these transportation agencies where they belong from the standpoint of service to the community as a whole. When logical routes are determined, we then urge the cities further to make provision for the development of not less than a six-line roadway on all bus and street-car routes. When we have to accept a four-line roadway for the time being, we make the same recommendation that Mr. Young would make."

MINIMUM CURVE RADIUS FOR PUBLIC SAFETY



FROM THE PLATTING GUIDE OF THE BOARD OF PUBLIC LAND COMMISSIONERS, MILWAUKEE

See article on page 500 of this issue

Equipment and Costs of Small-City Fire Departments

AN inquiry regarding fire losses and fire-fighting equipment in cities of from 8,000 to 18,000 population has brought to THE AMERICAN CITY from fire chiefs the information tabulated below, as to number and salaries of full-time firemen; size, cost and date of erection of headquarters building; number of pieces of motorized equipment; feet of fire hose; number of alarms; and total fire loss in 1923. The figures as to estimated population for 1923 and area in acres have been supplied from a recent report of the Bureau of the Census.

City	Estimated 1923 Population	1922 Area (Acres)	Full Time Firemen		Headquarters			Pieces of Motorized Equipment	Fire Hose (Feet)	No. of Alarms 1923	Fire Loss 1923
			No.	Total Salaries	Size	Cost	Built				
Adrian, Mich.	12,278	2,803	14	$19,300	75x60	....	1865	5	6000	168	$13,500
Albany, Ga.	12,714	2,424	14	20,000	100x40	20,000	1909	5	6500	160	48,000
Albion, Mich.	9,261	2,004	7	9,800	100x30	5,000	1884	3	4000	71	20,130
Anaconda, Mont.	12,221	802	7	12,000	50x60	50,000	1896	3	4000	65	8,000
Ashland, Wis.	11,334	8,182	19	26,820	70x44	25,000	1918	4	6000	248	20,457
Atchison, Kans.	12,630	1,773	17	24,000	90x50	40,000	1912	7	8000	220	22,000
Batavia, N. Y.	14,144	3,606	18	22,250	65x55	....	....	3	5000	128	16,784
Beatrice, Nebr.	9,773	3,020	5	6,800	100x60	12,000	1909	2	5000	52	35,790
Bedford, Ind.	9,206	1,157	10	15,120	60x30	4,000	1902	3	3500	168	.....
Bellefontaine, O.	9,806	1,900	7	10,800	80x40	6,000	1898	2	2600	105	8,690
Billings, Mont.	16,927	1,824	15	25,000	40x70	20,000	1896	2	5500	99	19,400
Brownsville, Tex.	12,250	4,263	8	7,500	50x50	7,000	1908	3	4650	42	8,700
Cairo, Ill.	15,438	1,440	12	14,500	75x25	14,000	....	3	5000	200	20,000
Carthage, Mo.	10,318	2,733	10	8,800	48x50	.....	1883	2	3000	84	14,000
Casper, Wyo.	15,634	2,070	19	32,632	.....	....	....	5	7900	124	21,780
Champaign, Ill.	17,521	2,720	14	30,000	100x75	50,000	1914	5	5400	213	29,000
Chickasha, Okla.	10,179	2,069	13	20,400	50x65	20,000	1907	4	5000	109	102,910
Collinsville, Ill.	10,573	1,960	2	2,400	80x40	12,000	1910	2	2500	60	14,410
Defiance, Ohio.	9,433	2,209	4	5,200	100x80	10,000	....	3	3200	56	50,000
Dover, N. J.	10,643	1,600	1	1,800	75x40	10,000	1874	3	6000	100	15,000
East Youngstown, O.	14,695	1,068	4	7,400	150x60	60,000	1912	2	1600	45	7,300
El Dorado, Kans.	13,830	1,231	7	12,000	70x50	....	1879	3	3000	101	9,000
Eureka, Calif.	13,311	3,731	9	13,500	....	....	....	2	4700	130	.....
Elizabeth City, N. C.	9,108	1,400	4	4,020	80x55	6,500	1895	4	7500	134	16,580
Forest Park, Ill.	12,273	1,280	5	10,000	100x60	25,000	1918	3	2200	..	.....
Gainesville, Tex.	9,016	4,735	4	5,560	75x40	10,000	1918	4	5000	60	12,500
Glendale, Calif.	18,280	9,323	23	41,000	70x50	10,000	1913	6	5000	229	13,035
Goshen, Ind.	9,890	2,830	10	12,636	44x40	5,000	1899	2	4000	113	21,572
Grand Island, Nebr.	15,000	3,938	11	16,800	60x17	....	....	2	3600	127	864
Greenville, Pa.	8,890	921	..	.....	100x60	15,000	....	2	2500	38	6,000
Griffin, Ga.	8,513	2,010	9	10,380	75x50	35,000	1910	2	6000	69	13,000
Gulfport, Miss.	8,794	6,720	7	8,760	90x25	50,000	1905	4	3500	60	9,461
Guthrie, Okla.	11,792	2,000	11	14,602	70x50	11,000	1903	.	6000	91	3,276
Hattiesburg, Miss.	13,788	6,954	15	19,320	60x40	85,000	1922	3	4000	171	42,000
Holland, Mich.	12,792	1,830	4	6,570	70x24	4,000	1894	2	7000	96	35,000
Huntsville, Ala.	8,164	1,280	7	750	100x50	.....	1913	2	2500	..	.....
Idaho Falls, Idaho.	9,230	1,913	5	8,640	70x35	3,000	1915	2	4700	42	22,946
Ilion, N. Y.	11,460	1,512	4	6,591	50x22	17,000	1887	4	5400	127	8,550
Independence, Kans.	12,430	1,783	8	11,220	70x30	....	....	4	3200	84	18,805
Independence, Mo.	12,344	2,140	7	9,060	40x25	.....	1907	1	2000	128	18,655
Johnson City, N. Y.	10,320	1,075	24	1,800	120x130	35,000	1900	5	5900	89	16,373
Jonesboro, Ark.	10,199	1,920	6	7,000	90x30	8,000	1916	2	3500	79	.....
Keokuk, Ia.	14,570	3,520	14	19,500	60x50	8,000	1856	3	6000	285	50,000
Laconia, N. H.	11,153	9,500	5	7,500	60x40	10,000	1903	2	8000	172	92,000
LaGrange, Ga.	21,165	7,752	7	6,532	40x30	4,500	1909	3	4000	72	30,729
Latrobe, Pa.	9,799	897	1	1,200	60x25	10,000	1919	1	3500	13	1,112
Leavenworth, Kans.	16,912	4,800	17	22,740	81x26	....	....	4	3400	272	23,414
Mankato, Minn.	13,225	4,301	10	15,000	90x45	20,000	1898	6	6000	173	36,000
Marlborough, Mass.	15,189	13,435	9	16,425	85x50	35,000	1909	4	5650	148	19,510
Merrill, Wis.	8,068	3,195	10	12,000	54x32	12,000	1915	3	6000	133	12,968
Millvale, Pa.	8,091	400	2	3,500	58x35	18,000	1900	3	6000	106	12,000
Modesto, Calif.	11,118	1,937	14	21,000	100x50	30,000	1909	5	8000	97	5,180
Monmouth, Ill.	8,116	1,440	5	6,500	70x40	12,000	1866	3	4000	97	22,000
Monroe, La.	13,639	3,086	24	31,800	60x45	20,000	1909	5	7500	131	56,000
Monroe, Mich.	13,260	4,500	11	22,000	65x34	1,200	1852	4	2700	127	7,500
Mt. Vernon, Ill.	10,466	1,520	2	3,000	60x40	800	1904	1	2000	74	25,000
Murphysboro, Ill.	11,862	2,370	6	9,000	100x100	35,000	1882	3	2000	143	57,000
Norfolk, Nebr.	9,572	1,140	4	5,880	50x48	6,000	1886	2	4300	61	17,692
Oneida, N. Y.	11,343	14,350	8	12,720	40x28	....	....	4	100	60	15,842
Parsons, Kans.	17,313	2,600	17	26,000	70x50	5,500	1906	3	4500	173	61,000
Phoenixville, Pa.	10,484	1,467	4	4,920	90x30	20,000	1900	3	3800	44	3,262
Plattsburgh, N. Y.	10,909	3,333	6	7,100	48x48	.....	....	2	4800	108	23,000
Pocatello, Idaho.	17,123	1,828	13	25,980	80x35	15,000	1905	4	7000	114	7,763
Provo City, Utah.	10,800	7,104	7	10,000	75x50	20,000	....	4	4200	72	1,800
Rahway, N. J.	11,655	2,582	9	17,000	55x48	.....	1867	3	5500	130	55,000
Red Wing, Minn.	8,637	4,627	11	14,670	70x45	30,000	1906	3	6000	110	21,513
Rome, Ga.	13,667	1,968	22	27,000	100x50	....	1916	7	8000	162	.....
San Angelo, Tex.	10,050	4,794	11	8,300	120x50	15,000	1910	4	4300	86	19,000
Santa Rosa, Calif.	9,098	1,310	6	9,415	80x40	13,500	1907	3	4500	88	33,464
Shelbyville, Ind.	9,773	985	8	11,388	110x60	24,000	1916	2	6100	88	6,280
Sheridan, Wyo.	9,465	1,466	8	12,480	50x30	8,000	1912	3	4200	50	9,419
Streator, Ill.	14,968	2,076	12	18,000	65x50	3,500	1900	2	4000	156	35,000
Thomasville, Ill.	8,725	2,010	7	10,189	48x65	.....	1883	2	5350	85	4,049
Virginia, Minn.	15,300	5,671	32	30,600	75x75	.....	....	4	6500	83	17,600
Waynesboro, Pa.	10,627	1,495	2	2,213	95x50	14,000	1889	3	3500	95	16,372
West Frankfort, Ill.	10,772	800	2	3,600	80x40	2,000	1922	1	2500	65	32,000
W. Palm Beach, Fla.	12,151	9,582	17	22,770	65x38	10,000	1905	6	5800	38	15,223
Willimantic, Conn.	12,726	2,870	9	11,462	56x35	.....	1886	3	6500	128	42,106

The Street-Lighting Demonstration at Columbus, Ohio

By M. S. Hopkins

Consulting Engineer; Chairman, Street-Lighting Committee, Chamber of Commerce, Columbus, Ohio

EDITOR'S NOTE.—*Columbus, Ohio, is at present a veritable outdoor laboratory for testing street-lighting units of different kinds, equipment and make, under actual operating conditions.*

The Chamber of Commerce of that city, realizing the desirability of better street lighting, took up the matter and induced a number of manufacturers of street lamps and standards to install such devices along various Columbus streets—both business and residential—so that they can be seen and judged by the public as they would appear if adopted there.

Columbus is particularly fortunate in this matter. There has never before been such a demonstration on a scale comparable with this, and it is very doubtful if there will be another. The cost of installing these units totals thousands of dollars, and the expense is so great that it is improbable that the exhibiting companies, which are paying the cost, will consent to do it again.

This installation affords an excellent opportunity for committees or individual citizens of other cities interested in better lighting for their own community to see these different types in operation by visiting Columbus.

By arranging for the showing of these units in actual operation, the Columbus Chamber of Commerce hopes to hasten the adoption of a modern lighting system by the city. It named M. S. Hopkins as consulting engineer. His comments on the demonstration are given in the following article.

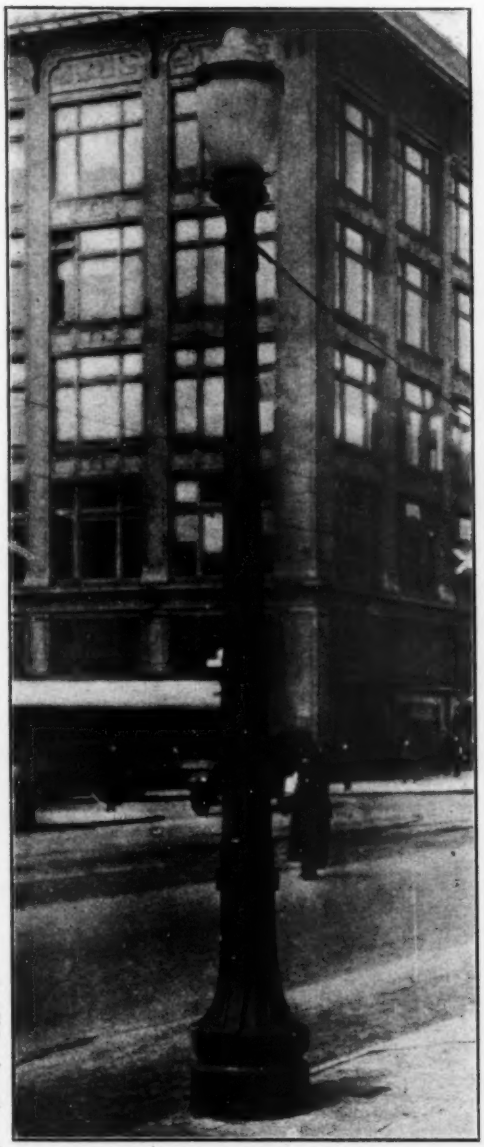
COLUMBUS, one of the youngest of the modern cities of the Central West, which has experienced a phenomenal growth and now stands as one of the prominent commercial distributing points of the country, is striving to become one of the best-lighted cities in America. Its present lighting system is obsolete and inadequate for the capital city of Ohio. There are eight varieties of lighting units, including about 1,250 of the five-globe cluster incandescent fixtures used to decorate more than to illuminate the business section. For the residential and remote business districts, low-power pendant arcs and incandescent lamps are used.

Mayor Thomas, who is now serving his second term as chief executive of the city, advocated during his first campaign a general and thorough improvement in all public utilities of the city, especially the street-lighting system. Soon after his election, in conference with Colonel Edward Orton, then President of the Chamber of Commerce, and W. H. Duffy, Director, Public Service Department, it was openly admitted that Columbus was poorly lighted for a city of its size, and that steps should be taken at once with a view to modernizing its street illumination. At the suggestion of Colonel Orton, a committee of the Chamber of Commerce was appointed, with the writer as chairman. In April, 1922, this committee began its work. Instead of taking a junket about the country, visiting various cities where different types of modern street lighting are installed, such as New Orleans, Los Angeles, San Francisco, Salt Lake City, Denver, and some cities in the East, it was decided to bring the exhibits to Columbus, where not only could the committee draw better comparisons, but the people themselves could see and judge. The result has been that the General Electric, Westinghouse, Western Electric, Holophane, Massey and other electrical manufacturing companies have installed 32 different exhibits. Six distinct groups of lighting standards have been installed in the business section, and five groups in the residential section.

In the sections where the temporary new lights have been installed, the old type fixtures have been turned off so that it is easy to see and draw marked comparisons as to just what the various new lights will do. The glare, or dazzling effect, of each unit, the silhouette, or ability to see objects in outline by different lights, the best height for poles and the plan for locating them can be easily determined. The exhibits are so arranged as to show the results from two lamps to a pole, one lamp to a pole, either luminous-arc or incandescent type, located opposite one another or staggered.

Street Lighting to Be Zoned

Another outstanding feature of the Columbus plan has been the proposed zoning of the city into lighting districts and specifying wattage per lineal foot rather than candle-power for each zone. Five divisions have been made,

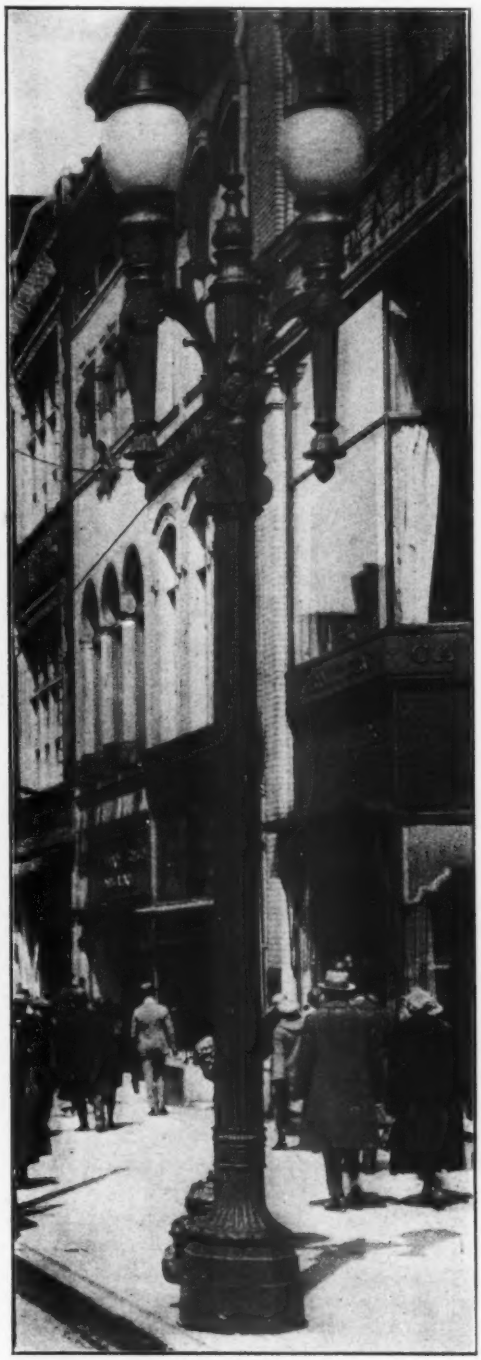


A TYPICAL SINGLE-UNIT INCANDESCENT ORNAMENTAL LAMP AND STANDARD INSTALLED BY THE WESTERN ELECTRIC COMPANY IN ITS EXHIBIT IN COLUMBUS, OHIO

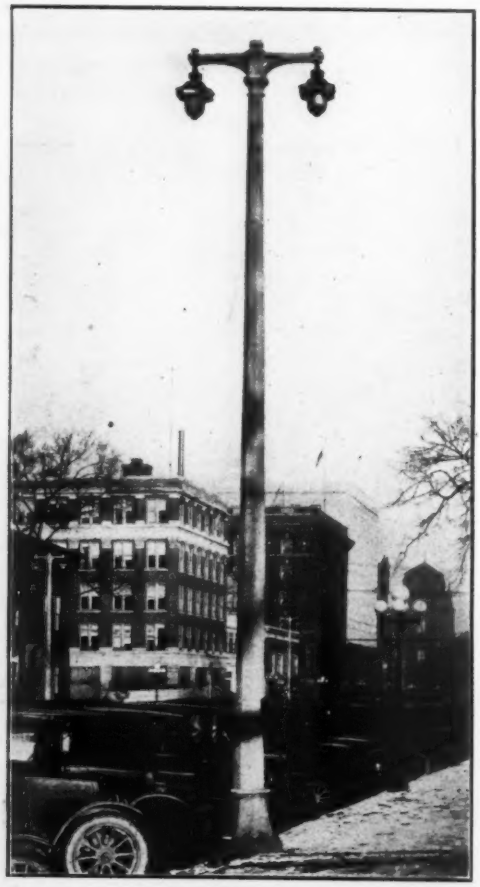
namely, central business, business, boulevard, residence, and intensive business or "White Way."

For the central business section, the committee has placed a limit of 8 watts per lineal foot; for the rest of the business section, 6 watts; for the boulevard or wide-street residential section, 2½ watts; for the remainder of the residential section, 1¼ watts; and for the "White Way" district no limitation has been placed.

Exhibits on High Street, the main thoroughfare of Columbus, constitute the central business display. Here are placed single and double Westinghouse units containing Mazda



A GENERAL ELECTRIC DOUBLE-UNIT ORNAMENTAL LUMINOUS ARC INSTALLED IN THE COLUMBUS, OHIO, DEMONSTRATION EXHIBIT



ONE OF THE MASSEY 30-FOOT CONCRETE STANDARDS EQUIPPED WITH HOLOPHANE REFRACTORS AND LINE MATERIALS GLASSWARE AND 2500-CANDLE-POWER MAZDA LAMPS IN THE TWIN UNITS FOR THE WHITE WAY EXHIBIT ON BROAD STREET, COLUMBUS, OHIO

lamps of 1,000 and 1,500 candle-power on poles 16 feet high, installed opposite and spaced 110 feet apart; oranmental General Electric luminous twin unit arc lamps on 20-foot poles, spaced 135 feet apart, and single and twin Western Electric Mazda units of 1,000 and 1,500 candle-power on 15-foot poles spaced 91 feet apart in such a way as to show the light effect of single units between double or twin units.

Business section exhibits are installed on two streets, Front and Third Streets. On Front Street, the present cluster-light pole has been redesigned with a new top and base to increase its height, and 600-candle-power Mazda lamps in General Electric ornamental Novalux fixtures have been installed. These are spaced 90 feet. On Third Street, the present cluster-light pole has also been remodeled, giving a 16-foot height to the light center. Six-hundred-candle-power Mazda lamps, in Westinghouse octagonal Junior Reflectolux fixtures, have been installed in staggered arrangement at 45-foot distances.

The boulevard exhibits are installed on Neil Avenue, which has a 50-foot roadway. Here are two types of street lighting—the arc and the Mazda lamp. For a distance of four blocks there are General Electric luminous arc lamps, mounted on 5-foot brackets, 20 feet from the roadway. For two blocks are exhibited two types of pendant incandescent fixtures, one by the General Electric and one by Westinghouse. In each exhibit 600-candle-power Mazda lamps with light center 20 feet from the roadway, are used. These are spaced about 110 feet apart. Different kinds of globes are used to bring out different features.

The other type of residential exhibit is on Dennison Avenue, where Mazda lamps of

WESTINGHOUSE SINGLE-LIGHT POST WITH 1000-CANDLE-POWER LAMP

250 and 600 candle-power, placed 18 feet from the roadway and spaced 210 feet apart, are installed. Different type fixtures and refractors are used, including special units designed for Columbus by the General Electric Company and Westinghouse.

For the White Way, there are three exhibits, two on High Street and one on Broad Street, the latter alongside the State Capitol. One of these is the twin unit of General Electric ornamental luminous arc lamps, 135 feet apart on 20-foot poles and spaced opposite one another. The other exhibit is also of twin fixtures using 1,000- and 1,500-candle-power Mazda lamps, and is made by the Westinghouse Company. On Broad Street, a 120-foot roadway, a somewhat unique fixture has been installed by the Holophane Company. It consists of a twin unit mounted on a 30-foot Massey concrete pole, placed staggered, 2,500-candle-power Mazda lamps in Holophane refractors being used.

The History of Street Lighting in Columbus

Columbus was one of the first cities of the country to use electricity for illuminating purposes. Approximately 37 years ago the original installation was made by a corporation formed for this purpose. A contract was entered into with the City Council at a price of more than $100 per lamp per year on a 25-year franchise basis. The company furnished all the necessary machinery for the generation of current, supplied the lamps and erected the poles and wires.

This first method of electric street lighting was very satisfactory from the standpoint of lighting only, as the open arc light was used, which, although expensive and difficult to maintain in steady operation, was more efficient in the production of light than any of its successors.

After some 25 years of periodical negotiations with the City Council over the price asked for light, the company's equipment had become so old and deteriorated that the company was compelled to ask for a decided increase in rate to help cover the cost of a new plant. This resulted in a decision by the city of Columbus to install its own plant, taking over the company's wires and poles. The municipal plant was built, and the city adopted the newly developed AC enclosed arc lamp, replacing the old open arc. However, the AC arc developed many defects and soon had to be abandoned, and replacements were made just as fast as the city's finances would permit, with the newly developed high-candle-power incandescent lamp and the luminous arc lamp. The arc lamp adopted then was what is known commonly as the 4-ampere lamp, much smaller than the standard now used, known as the 6.6-ampere lamp.

These small arc lamps were placed principally in the northwest part of the city, and it is interesting to note that they have maintained their efficiency throughout the twelve or more years they have been used. In fact, with new electrodes, these same arcs are being used in the new exhibits on Neil Avenue.

When the Chamber of Commerce became interested, two years ago, it was felt that four watts per lineal foot should be the limitation; but this was found inadequate and was changed to 8 watts for the central business district and 6 watts for the business district. This change delayed the work a year, as manufacturers, planning exhibits, had to design special apparatus to meet the new requirements.

It is interesting to note that the work of this committee, which started in a small way, has become one of the most important studies of street lighting ever made, especially in the actual installations. So far as known, no other city has ever carried an investigation to such an extent, and any city contemplating modernizing its street lighting would do well to investigate and see the display now in Columbus.

The committee has apparently disregarded many of the older methods or precedents in street lighting, and has recognized the great difference the advent of the automobile has made in the problem of street illumination. Its slogan now is "visibility or ability to see," rather than how much light. Visibility is greatly affected by the glare from the automobile headlight, as well as from too brilliant street lights.

The different exhibits will be compared by taking the ratio of the wattage specified to the watts actually used, and the visibility will be determined by considering the direct illumination, silhouette effect, and ability to read a chart when the eye is screened with screens of different density.

To sum up the work of the committee, it has endeavored to ascertain the uncertain features of the art of street lighting and point out their possible solutions for the benefit of the taxpayers of the city.

Development of Bituminous-Base and Sand-Asphalt Pavements

By E. R. Olbrich

Of the National Research Council; recently Construction Engineer, North Carolina State Highway Commission

THE name "sand-asphalt" is obtained from the mixture of sand and asphalt utilized in recent road construction in North Carolina. However, this pavement is truly of the black-base or flexible type, the chief difference from the usual black-base being that no stone is utilized in the pavement either in the base or in the top.

The ordinary black-base construction, using an asphalt-concrete base of stone and sand and asphalt, has been standardized for some years, and is more or less familiar to engineers.

Field for Black-Base Pavements

The black-base type of pavement is ideal for passenger-car traffic and pneumatic-tired truck traffic. It will carry any volume of this traffic, but because of its flexible nature is not so well adapted to carry a large volume of heavy solid-tired truck traffic. The writer has observed that under the constant impact of heavily loaded solid-tired trucks a bituminous-base pavement, with a 3½-inch base and a 1½-inch top, gradually developed an uneven and wavy surface. Where the volume of solid-tired truck traffic is large, I believe that a concrete pavement or concrete base would be best adapted to the traffic.

Given a good subgrade, it is possible to increase the depth of the base to 6 or 8 inches, so that the base may absorb greater loads, but this would be economically out of the question on country roads. Such construction may be economical on heavy-traffic city streets, and has the advantage that the pavement on completion may be thrown open to traffic. Cuts in the pavement and repairs are quickly made.

The bituminous-base pavement generally cannot compete economically with the cement-concrete pavement except where it is possible to utilize local materials. This is due to the fact that it is necessary to heat all the ingredients in the pavement. This requires additional machinery, labor and fuel, and adds considerably to the cost. However, where it is possible to utilize local material—generally sand—it is possible for the bituminous-base type to compete with the concrete-pavement and concrete-base types. In North Carolina the only two bituminous-base jobs let to contract were able to underbid the concrete-pavement and concrete-base types because of the presence of local sand.

Drainage and Subgrade

A bituminous-base pavement should not be constructed except where good drainage and a good soil assure a uniform, unyielding subgrade. Any settlement of the subgrade is bound to be reflected in the pavement, resulting in an irregular surface. A subgrade disturbed by frost action will produce failure in the pavement. In this respect a well-drained sand soil makes an excellent subgrade, as it is not much disturbed by frost action and affords uniform bearing.

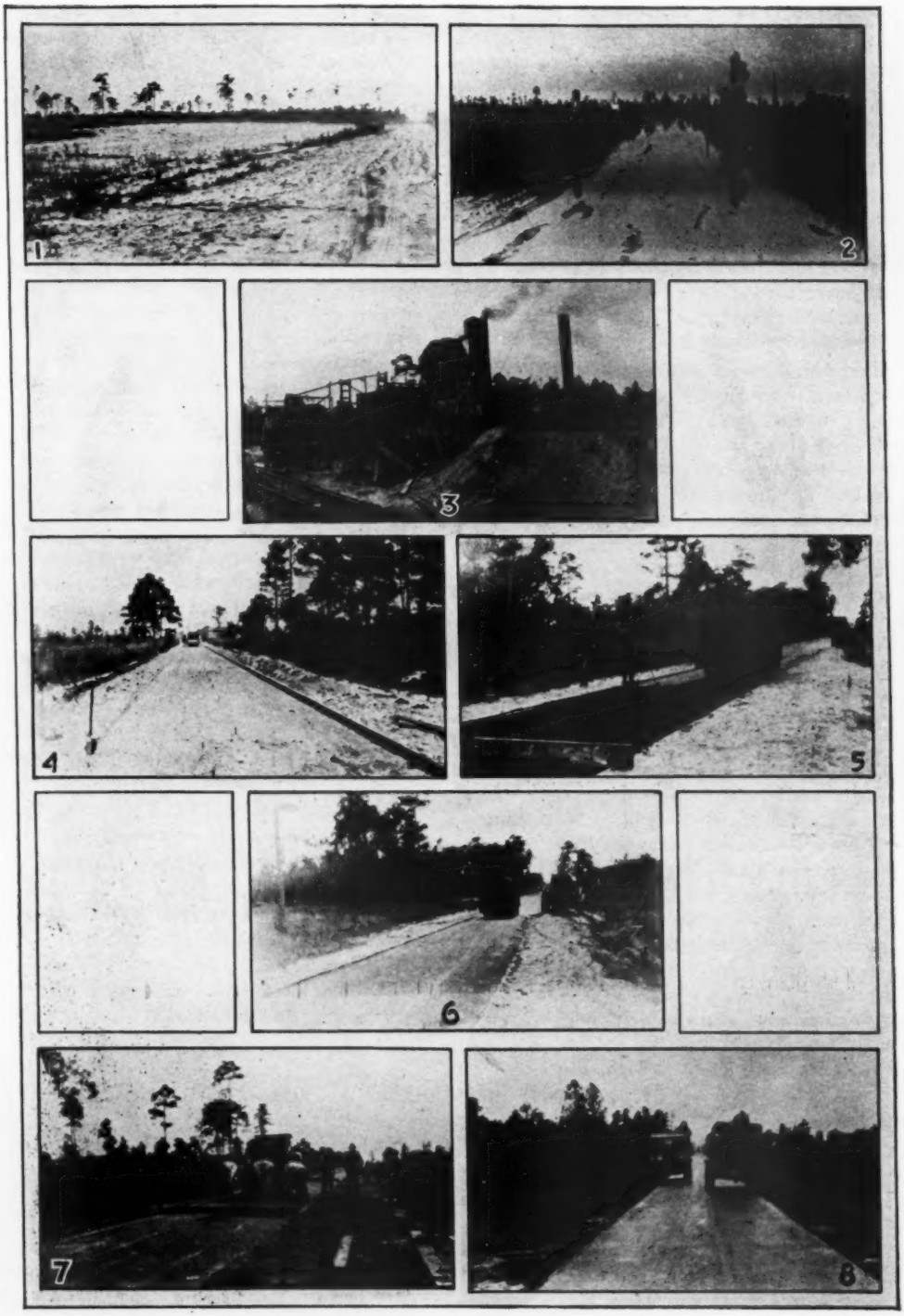
Penetration of Asphalt

The penetration of the asphalt used in mixed bituminous pavement work in North Carolina is from 40 to 50. The writer has for some time felt that the penetration of our mixed asphalt pavements could be dropped an average of 10 points or more without danger of brittleness, using a 30-40 penetration in the South and a 40-50 penetration in the North. In the case of asphalt macadam pavement a penetration of 60-70 would be suitable in the South and 70-80 in the North.

The work of the Bureau of Public Roads at Arlington in testing the stability of asphalt mixes, has shown that the penetration or stiffness of the asphalt is one of the important factors in the stability of the mixed pavements. By stiffening our asphalt in the mix, added assurance against pushing is obtained with little or no additional cost.

Forms

Wooden forms are generally used in bituminous-base construction. One of the chief causes of irregular or wavy surfaces in bituminous-base pavements is the use of warped wooden forms or woden forms badly set to



SCENES IN THE CONSTRUCTION OF BITUMINOUS-BASE AND SAND-ASPHALT PAVEMENTS

1. An old trail in dry weather, showing hard going because of sand. 2. The same trail in wet weather with equally difficult going because of water-soaked subgrade. 3. The mixing plant for the production of the sand-asphalt mixture. 4. The finished subgrade with forms in place. 5. Rolling the base course. 6. The finished base ready for surfacing material. 7. Laying the top course of the sand-asphalt pavement. 8. The finished pavement, an excellent piece of work but too narrow, causing passing vehicles to force each other out onto the shoulder

line and grade. Where wooden forms are used, 2-inch straight timber, solidly staked to line and grade, should be used and allowed to remain in place, as the forms will be found to be badly warped and bent if removed.

An experienced form-setting gang should be employed, as too much care cannot be exercised in obtaining a good line and grade of the forms. The wooden forms should not be set too far in advance of the laying of the base, for the action of the sun and rain will soon warp them.

Development of the Sand-Asphalt Pavement

The development of the sand-asphalt pavement is a story of adaptation to local conditions and utilization of local materials. Picture in your mind a sea of sand stretching for hundreds of miles along the coast of North Carolina and for some distance back inland. In many sections this sand is practically clean and free from clay or loam which might act as a binder. This clean, loose sand offers little tractive value to motor vehicles, particularly in dry weather, and offers great resistance to the passage of team-drawn vehicles. The driving wheels of a motor vehicle spin in the sand, so that it is frequently necessary to go into second or low gear for long distances at a speed of from three to eight miles per hour. There is a stretch of about forty miles of bad sand between Wilmington and New Bern, N. C., through which it takes an average of from five to seven hours to drive. Motorists prefer to make long, circuitous trips on the less sandy roads in preference to taking the direct route through the heavy sand. It may be readily appreciated that some type of road surface is necessary to lift this community, not "out of the mud," but "out of the sand." An attempt was made to haul in clay to be mixed as a binder with the sand. Owing to the scarcity and long haul of the clay, the cost was prohibitive and the result was unsatisfactory.

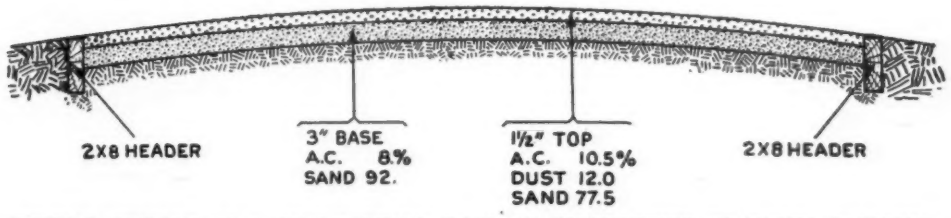
North Carolina's Road Problem

The funds available for the construction of a large system of good roads in North Carolina were necessarily limited. Gravel and top-soil are not available in this section for surfacing material. There is no stone, gravel or concrete sand available within a radius of 150 miles. The cost of shipping in sand and stone for the construction of a concrete pavement or concrete base would be a very considerable item. In addition, some of these construction projects are from 10 to 15 miles from the nearest railroad, which makes it necessary to haul the cement, sand and stone for concrete construction from the railroad siding to the job by trucks or teams. These factors made the prospective cost of concrete construction run from $3 to $4 per square yard. This high cost would reduce materially the mileage of hard-surface roads that it would be possible to construct with the funds available. Furthermore, the volume of traffic, except in a few instances, would not warrant the cost of a high-type concrete-pavement or concrete-base construction. The solution of the problem was in the development of some type of hard surface from the only material available—the local sand. Massachusetts, Delaware and Florida had experimented with mixtures of local sand and asphalt for road surfaces. North Carolina has developed the sand-asphalt type of construction, until at this time it is well past the experimental stage. About 40 miles of sand-asphalt pavement have been constructed by state forces in North Carolina, and a large mileage is under construction at this time, either by contract or by state forces. The pavement first constructed has been down for over one and one-half years, and has proved very satisfactory in every way.

Use of Local Material Allows a More Intensive Construction Program

The speed with which a large highway construction program may be prosecuted in any state, assuming that necessary funds are available, depends, in addition to climatic and weather conditions, on two main limiting factors: (1) the number of competent contractors available; (2) the ultimate quantity of road material available and the facilities for transporting these materials.

As long as payments are assured and there is a fair margin of profit in it for the contractor, his number will increase, so that this is not the final limiting factor, but no more hard-surfaced roads can be built than we have cement, stone, sand and gravel available at an economical cost; furthermore, these materials must be moved to the job, and railroad transportation facilities are always taxed during the peak of the construction season. Therefore, the use of 88 per cent of local materials in the construction of a hard-surface road, as in the sand-asphalt pavement, makes just that much more cement, sand and gravel available where most needed, and releases a large number of railroad cars for duty elsewhere.



TYPICAL SECTION OF A SAND-ASPHALT ROAD AS CONSTRUCTED IN NORTH CAROLINA

Investigation for Suitable Sand

If it is desired to construct a sand-asphalt surface on any given project or section of road, it is first necessary to determine whether there is sand of suitable quality present in sufficient quantities for road construction. The sandy surface of the country is generally underlain by a clay or hard-pan at no great depth, and it is necessary to seek for pockets or pits of clean sand of sufficient depth and area to provide enough sand for perhaps 10 to 15 miles of road.

Grading of the Sand:—On the the first 10-mile section of sand-asphalt construction in North Carolina, a sand-pit was found which gave a sheet-asphalt grading. The sand is practically pure silica, clean, hard and fairly angular, with a surface worn rather smooth like a beach sand. This smooth surface probably accounts for the fact that the sand will not carry quite as much bitumen as the ordinary river or pit sand found further inland.

When an investigation was made later for sand for a number of other projects in various sections, it was found that the sand available was similar in all respects to the sand used on the first project, except that it was uniformly much finer, practically all of it passing a 40-mesh sieve.

In order to conform to previous practice and experience in sheet-asphalt construction, it would have been necessary to ship in coarser sand from some distance inland to be used with the finer sand to obtain a sheet-asphalt grading. This would have materially increased the cost and defeated the purpose of the sand-asphalt construction, which was the utilization of local materials and low-cost construction. The suggestion was then made that a uniform grading be maintained between the 40 and 200 meshes instead of between the 10 and 200 meshes. The work was carried on on this basis, and the results have been entirely satisfactory to date.

The use of this fine sand without an admixture of coarse sand represents one of the most important developments in the sand-asphalt pavement, and is a radical departure in sheet-asphalt construction. It opens up a much wider field for the use of sand-asphalt pavement, in that it provides much greater areas in which the local sand may be used.

Subgrade

The material in the subgrade, as is to be expected, is quite generally loose sand. However, outcrops and pockets of clay soil are encountered, and in one instance a project stretched from a section of sandy soil into one with a soil of rather high clay content. In such cases, the practice has been to haul in sand and place it on the clay subgrade for the full width of the grade, in order to assure good drainage. It is preferable to scarify and work the sand into the clay, as the clay acts as a binder and gives a more compact subgrade.

An important prerequisite for the success of the sand-asphalt pavement is that it shall have a uniform, well-drained subgrade. This is true of any type of pavement, and is a statement so trite that it is axiomatic, but it is of prime importance in the case of the sand-asphalt pavement or any type of black-base pavement, as it is a flexible type of surface, and under the action of traffic and temperature will conform to any change or movement in the subgrade, resulting in an irregular surface and perhaps failure. Fortunately, sand when confined offers a uniform and well-drained subgrade. It is desirable to keep the grade of the pavement as high as practicable in the low, flat country, particularly where swamps are encountered.

Location of Plant

The ideal set-up for the plant is the case in which the road parallels the railroad, and the borrow-pit for sand is along the road about midway of the projected highway. It is then possible to ship in asphalt and filler on the plant siding, and the sand is hauled from the pit to the plant by slip-teams. It is good policy to set up the plant as near as possible to the borrow-pit, so as to reduce the haul of the sand to the heating and drying unit as

much as possible. This offers ideal conditions for low-cost construction. However, it is sometimes the case that the only available sand-pit is located some distance either from the railroad or from the highway, or both.

When the plant set-up is removed from the railroad, the light portable type of asphalt plant is most practical. The asphalt must be hauled in barrels and the filler in sacks to the plant.

Where the plant set-up is removed from the project, it is found necessary to build a driveway or temporary road from the plant to the project, over which the trucks can haul the hot mix. It is impossible to get the loaded trucks through the loose sand. A driveway was built on one job, having a width of 10 feet and using a base mixture 3 inches deep after compaction, at the rate of $2,500 per mile.

An asphalt storage tank equipped with heating coils should be a part of the plant. It reduces demurrage on tank cars and is assurance against running short of asphalt.

Plant Operation

The sand is carried by drag-pans from the borrow-pit to the stock pile at the sand drier. The mixing operation is similar to that of the usual mixed types of pavements. Average base and top mixes are indicated on the typical section.

The capacity of the small portable type of mixer was found to be about 700 square yards of 3-inch base, or 1,400 square yards of 1½-inch surface, per 10-hour day.

Hauling the Mix to the Road

The pavement construction is started at the plant, and the construction proceeds away from the plant, so that the hauling of the mix is done over the finished pavement. Therefore, it has been found economical to use light, pneumatic-tired, one-ton trucks for this purpose.

Road Operation

The finished pavement is being constructed either 10 feet or 16 feet wide. A very large mileage of sand-asphalt pavement is needed in this sandy country, and funds must be conserved as much as possible, in order to stretch them out into the greatest possible mileage. Therefore, in comparatively undeveloped sections, a 10-foot width has been adopted; whereas, in the more traveled sections near the cities and larger towns, a 16-foot width is used. If traffic later demands it, and funds are available, it will be a comparatively easy matter to widen the 10-foot road to 16 or 18 feet.

The grade is built up 30 feet wide, whether the road is built 10 feet or 16 feet wide. It is not practical to roll the sand fills and subgrade with a large tandem or steam roller, and a grooved or ring roller has been utilized to search out soft places and give a uniform subgrade.

The forms are set by a form-setting gang and are left in place after the pavement is completed, to act as a protection to the edge of the pavement. After the forms are set, another small gang completes the fine grading. The forms should be solidly staked to line and grade, and the subgrade should be uniformly compacted before the base course is laid.

The base course mixture is delivered at the road at as low temperature as is consistent with proper raking and spreading, for it is necessary to delay the rolling until the base course has cooled sufficiently to permit satisfactorily rolling the loose-raked material on the sand subgrade. The base course is laid to a compacted depth of 3 inches. The rolling of both the base and the top course is done with an 8-ton tandem roller.

The surface course mix is laid at a uniformly high temperature of 300° F. to 350° F. to assure a good bond between the base and surface courses. Templates are used in spreading both base and top courses, and the finished surface is checked with a straight edge. The surface course is laid to a compacted depth of 1½ inches.

The average density (relative solidity) of the base course ranges between 1.85 and 1.95. No filler is used in the base course mix. The average density of the surface course ranges from 1.95 to 2.05, seldom going beyond 2.10. The average densities of sheet asphalt laid on a cement concrete base are slightly higher than these figures, probably because there is a certain amount of yielding or flexibility of the black base under the passage of the roller over the newly raked surface course. However, frequent cutting of samples, and its action under traffic, show the surface course to be an exceedingly tough, dense mix.

A close control of the asphalt mix is kept by a field laboratory in charge of an inspector and by the main laboratory at headquarters.

The sand-asphalt pavement is a development of practical highway research. The need of a community for economical highway service was met by the utilization of local ma-

NORTH CAROLINA STATE HIGHWAY COMMISSION

FORTNIGHTLY COST SUMMARY SAND ASPHALT OPERATION

District 2 | County CARTERET

Project No. 200-B | From OCT. 1ST 1923 To OCT. 15TH 1923

	Cost per Sq. Yd.	
Hauling sand to drier	$ .079	36190
Labor drying sand	.027	12425
Fuel oil used drying sand	.140	64100
Labor mixing	.018	8200
Asphalt in mix	.295	139267
Dust in mix	.062	28918
Fuel for boiler—coal, wood, lubricating oil	.040	18164
Plant repairs, including plant engineer	.031	14748
Railroad demurrage on asphalt tank cars	.027	12700
Rent on asphalt tank cars	.010	4600
OTHER PLANT LABOR	.074	35505
Total Plant Operation	.810	374817
Truck drivers' pay roll	.032	15450
Gasoline and oil for trucks	.046	22213
Repairs, including mechanic	.011	4975
GAS OIL AND REPAIRS-ROAD EQUP.	.019	9128
Total Hauling to Road	.109	51766
Headers, labor	.027	13000
Material in headers	.065	30862
Fine grading, labor	.035	16660
Laying, raking, and rolling hot mix	.105	50335
Shoulders		1.5100
Total Road Operation	.263	125957
Extra work (describe)		
Total Extra Work		
Superintendence and timekeeping	.037	17950
Depreciation, plant equipment	.029	13722
Depreciation, road equipment	.012	6161
Interest	.013	6553
Miscellaneous		
Total Incidentals	.092	44386
Total Gross Cost		$ 596926

Total Gross Cost, Forwarded	$ 596926
Deductions (itemize):	
SHOULDERS	1.5100
Total Deductions	1.5100
Total Net Cost	$ 581826

PERFORMANCE

Headers (lin. ft. of road)	2200
Fine grading (cubic yards) 2000 LIN. FT.	240
Shoulders 7 FT. width (lin. ft. of road)	2700
Base (square yards)	4889
Wearing surface (square yards)	3731
Number working days	13
Number days worked 108 HOURS	12

Delays and cause (use back of sheet if necessary):

Total net cost, $ 5818.26 = $ 1.25 Cost per square yard.

Sq. yds. wearing surface

TOTAL NO. SQ. YDS. LAID TO DATE	37884.0
PERCENTAGE OF TOTAL	26.6
AVERAGE COST PER SQ. YD. TO DATE	$1.38

Remarks:

Compiled by .....
Resident Engineer.

COST SUMMARY FOR THE CONSTRUCTION OF SAND-ASPHALT ROADS IN CARTERET COUNTY, NORTH CAROLINA

terials. The three essentials of practical highway research are:

1. Recognition and understanding of the problem
2. Solution of the problem
3. Placing of the information obtained in the hands of those to whom it may be of value

The purpose of the Advisory Board on Highway Research, with which the writer is now associated, is to bring together the various agencies active in the investigation of problems in highway engineering and transport, in order that they may correlate the results of investigations already made, and to make plans for a program of research of urgent highway problems. Each organization will then concentrate its efforts on research along lines for which it is peculiarly adapted. The results can be translated and published in a form suitable to the highway engineering and transport field at large. The Advisory Board will act as an exchange to disseminate information and data obtained in the field of highway research.

Shoulders

With a 10-foot width of pavement, it is necessary for vehicles in passing to turn off the pavement with the wheels on the right side of the car. On account of the loose sand which composes the shoulder material, this has an element of danger for the thoughtless driver who does not slacken speed in passing. Therefore, every effort is made to encourage the growth of a tough, wiry native grass as a sod on the shoulders. In some places the grass would not take hold, and clay was hauled along the edges of the pavement and mixed with the sand to act as a binder.

Cost of Pavement

Accurate cost records of the sand-asphalt pavement have been kept, and a reproduction of one of the fortnightly cost reports is given above.

This report was made up so as to give the cost of (1) the plant operation, (2) hauling the mix, and (3) the road operation. Any work not directly chargeable to pavement operation, such as clearing and grubbing, extra-heavy fine grading, special drainage provisions, etc., is separated as "extra work."

The cost of the first 10 miles of sand-asphalt finished was $1.37 per square yard without the shoulder work. This figure includes allowance for interest, depreciation and overhead. The shoulder cost was about 10 cents per square yard, or about $700 per mile. Of four jobs now in operation, the average cost to date varies from $1.30 to $1.80 per square yard.

The total cost of plant, camp, hauling and road equipment, and accessories necessary to properly outfit a job of this kind, is from $22,000 to $25,000. Of this, about $12,000 is cost of plant equipment and accessories. If a larger type of plant is used, and larger trucks, the total cost may greatly exceed this figure.

Conclusion

The sand-asphalt pavement properly constructed on a uniform subgrade will carry an unlimited volume of passenger-car traffic and pneumatic-tired trucks. It is ideal for this type of traffic. It the volume of solid-tired heavy-truck traffic ever becomes large on any of these roads, it will doubtless be economy to build a cement-concrete pavement or base; but in the meantime the sand-asphalt pavement will have rendered many years of service at a low cost.

The sand-asphalt pavement has great possibilities of development, wherever unlimited local sand is available—along the Atlantic and Gulf Coast, in some of the lake states, and in the desert sections of some of the Western States.

Copper Sulphate Treatment of a New England Water-Supply

By E. Sherman Chase

Sanitary Engineer, Metcalf & Eddy, Consulting Engineers, Boston, Mass.

CAPE POND, the source of public water-supply for the town of Rockport, Mass., was treated with copper sulphate during 1922 and 1923 in order to control algæ growths, which give rise to the occurrence of objectionable tastes and odors. The methods employed and the results obtained are of interest, and the following account may suggest the value of more frequent adoption of this treatment for other water-supplies affected by algæ growths.

Rockport is located at the extreme tip of Cape Ann, about 30 miles northeast from Boston. The normal population of the town is about 4,000, which is increased to about 7,000 in summer, on account of the town's popularity as a summer resort. Cape Pond is a natural body of water located about one mile southwest from the thickly settled part of the town and about one mile west from the ocean. The ordinary high-water mark of the pond is approximately 70 feet above mean tide. The pond has an area of about 43 acres and a maximum depth below ordinary high-water mark of 23 feet. Its capacity at ordinary high-water mark is about 182 million gallons, these data being based upon an actual survey and soundings. The available storage capacity has been estimated at 85 million gallons. The pond is approximately 3,200 feet long with an average width of about 600 feet. It is one of the great ponds of the state and is therefore owned by the Commonwealth, from which the town has secured the right to take water for water-supply purposes.

The point of intake is approximately 900 feet from the northerly end of the pond and approximately midway between the eastern and western shores. The intake consists of an upturned elbow surmounted by a wire screen and is located in 23 feet of water at the deepest point of the pond. The end of the elbow is but a short distance above the bottom. The water is pumped from the pond to a stand-pipe located on a hill back of the pumping-station. From this stand-pipe the water is distributed by gravity to the town through several miles of water-mains.

Description of Pond and Watershed

Cape Pond occupies a narrow valley, the westerly and easterly slopes of which rise rather sharply from the pond to an elevation about 100 feet above water-level. There is

no inlet of any consequence, but a small intermittent outlet finds its way through a swampy area at the western shore. At the northerly end of the pond there is an area of low, swampy land of 10 acres or less. Considerable areas of shallow water, normal depth less than 10 feet, exist at the northerly and southerly ends of the pond and near the outlet at the westerly shore. Except at these points, the shores slope sharply to deep water. Considerable soft organic deposit is present in the bottom of the pond.

The fluctuations in water-level vary from year to year, the maximum on record being a difference of 6.1 feet in 1923, representing a capacity of about 78 million gallons. The maximum high water occurs usually in the spring, and the minimum in the late summer or fall. A portion of the stored water represented by the high level in the spring flows off through the outlet, but overflow occurs only at the higher water-levels.

The watershed of Cape Pond is approximately 222 acres in area and consists mainly of glacial drift deposits with a small amount of granite ledge on the hill upon which the stand-pipe is located. In view of the absence of any sizable inlet, it appears probable that the pond is largely spring-fed from ground waters collected in, and percolating through, the glacial drift. This is of significance in considering the quality of the water and the growth of micro-organisms therein.

The watershed is of little agricultural value and, with the exception of a very few acres, is covered with underbrush, scrub pine and deciduous trees.

Microscopic Organisms

The principal complaints relative to the supply have been in connection with disagreeable tastes, odors and discoloration. These unsatisfactory qualities have occurred mainly in the summer and have given rise to a feeling of dissatisfaction among the townspeople and summer visitors. Present-day standards require that a water-supply shall not only be free from contamination but also attractive and wholesome.

The water leaching through the swamp at the northern end of the pond dissolves considerable amounts of organic matter which provides food for the micro-organisms in the pond. The life, death and subsequent decay of these organisms result in the disagreeable tastes and odors. These organisms grow best in waters rich in organic matter and particularly in ground waters which contain oxidized nitrogen in the form of nitrate. Furthermore, sunlight is an essential requisite for their development.

In Cape Pond there are various types of micro-organisms at different seasons and in different years. One kind predominates, and then disappears, to be followed by another. Examinations made by the State Department of Public Health over a period of years show that the predominating organisms have been Asterionella, Cymbella, Melosira, Synedra and Tabellaria of the Diatom family; Anabaena and Coelospherium of the Cyanophyceae group; Cosmarium, Protococcus, Scenedemus, Staurogenia and Staurastrum of the Chlorophyceae group; and Chlamydomonas, Dinobryon, Euglena, Peridinium and Trachelomonas of the Infusoria group. Of these various organisms, Asterionella, Tabellaria, Anabaena and Dinobryon appear to have occurred most frequently. Asterionella gives an aromatic geranium or fishy odor, depending upon the intensity of occurrence of these organisms. Anabaena gives a grassy and moldy odor which has been likened to that of green corn, and upon death and decay produces a very disagreeable odor resembling that of a pig-pen. Dinobryon, like other protozoa, gives a fishy odor which is oftentimes one of the worst encountered in water-supplies.

While odors of various kinds may be present in the supply throughout the greater portion of the year, they are more apt to be present during the summer months when the organisms, upon death and decomposition, liberate the essential oils contained within their cell structures, which cause the odors. There is, however, no evidence that these micro-organisms produce sickness.

Red Water

Part of the trouble with the Rockport supply has been due to corrosion of mains and services, causing rusty sediment in the water. The trouble has occurred mainly in the hot-water pipes and has been more prevalent at the end of the summer. This rusty water not only offends the eye but causes rust spots on laundry.

Waters containing relatively large amounts of organic matter or of carbon dioxide are very liable to give this red water difficulty. The analyses of the Rockport supply show it to be high in organic matter, and soft. The few data available relative to the amount of carbon dioxide indicate that the quantity present at times is sufficient to stimulate the corrosive action of the water. This prevalence of carbon

dioxide is apt to be greatest when decomposition processes are proceeding at the most rapid rate, as in the summer months, when the temperatures are high.

Temporary Remedial Measures, Pending Filtration

Filtration of the supply has been recommended at various times in the past; for example, by H. W. Spooner in 1903, Henry A. Symonds in 1919, and by Metcalf & Eddy in 1922. Aeration as an adjunct to filtration has also been advised. Temporary remedial measures were advised during the summer of 1922, pending the installation of a filtration plant. It was suggested, therefore, that an attempt be made to control micro-organisms in the pond with copper sulphate. It was pointed out, however, that such a measure was only temporary and one not to be depended upon for permanent improvement.

Survey of Pond.—In order to have accurate data for proportioning the quantity of copper sulphate applied, a survey of Cape Pond with soundings was made during the latter part of May, 1922. Prior to the completion of the surveys, the numbers of micro-organisms in the pond water had begun to increase, and complaints relative to the quality of the supply were being received by the water-works officials. In order to control these growths, it was decided to proceed with the application of the copper sulphate without waiting for the completion of the survey and soundings, using approximate estimates of the pond capacity for computing the needed dose of copper sulphate.

Application of May 22, 1922.—On this date, some 425 pounds of copper sulphate, equivalent to 0.28 parts per million (2¼ pounds per million gallons), were applied to Cape Pond by towing bags containing this chemical from the stern of a boat rowed around the pond. Reasonable equalization of distribution was obtained by rowing more rapidly in shallow water and more slowly in deep water and also by rowing more rapidly when the bag was full of copper sulphate than when it was nearly empty.

Samples of the pond water were collected prior to the application of copper sulphate, one being taken over the intake, the second about half-way between the intake and the southern end of the pond, and the third sample about half-way between the intake and the pumping-station at the northern end of the pond. All three samples were collected at points about 1 foot below the surface. The samples had a slight musty and fishy taste and contained distinct amounts of fine organic suspended matter.

On May 24, two days after the application of copper sulphate, samples were collected at practically the same points as those collected on May 22. The water in the pond was still distinctly turbid with what were evidently growths of organisms. The samples were examined at the laboratory of the State Department of Public Health for total numbers of organisms, numbers of genera, and numbers of principal organisms.

There was comparatively little difference in the total numbers of organisms or in the predominating types. The samples collected May 24 showed somewhat higher total counts than those collected on May 22, due mainly to an approximately 100 per cent increase in the numbers of Anabaena. Asterionella, however, were materially reduced and organisms of the protozoan types were practically eliminated. Subsequent samples, collected on May 26, showed a total number of organisms less than one-half those present in the samples of May 22, and Anabaena about one-fourth the number present in the samples of May 24.

This first application of copper sulphate had no effect upon the fish life of the pond, and although the turbidity of the surface water continued to be distinct, that drawn from taps in the village had become satisfactory in so far as appearance and tastes were concerned.

Application of May 27, 1922.—In view of the failure of the copper sulphate to bring about a greater decrease in microscopic organisms and in view of the relatively small amount of copper sulphate first used, it was considered advisable to make another application, which was done on May 27 in a manner similar to that of May 22. The total amount of copper sulphate applied at the time of this second application was about 920 pounds, equivalent to 0.6 parts per million (5 pounds per million gallons).

The samples collected on May 26 represented the condition of the water prior to this second treatment. Samples were collected on May 29 and others on June 8, twelve days later. As in the case of the samples collected two days subsequent to the first application, the samples of May 29 after the second application showed a distinct increase in total numbers of organisms, but at this time Asterionella increased as well as Anabaena. The samples collected June 8, however, showed a marked reduction in total numbers of organisms, and Asterionella and Anabaena were practically absent.

It is interesting to note that in both cases the treatment was not followed by the immediate destruction of the organisms. It appears probable that this retardation of effect was due to the time required for the diffusion of the copper sulphate throughout the water. Had it been feasible to row the boat in lines closer to each other, the original application would have been more uniform, and more rapid results would probably have been secured. It is probable also that the effect would have been obtained more promptly had the chemical been dissolved in water and sprayed over the surface of the pond, but this would have been somewhat more difficult and would have involved greater expense.

The second application followed the first so closely that the accumulated quantity of copper sulphate in the pond water was equivalent to about 0.88 parts per million (7¼ pounds per million gallons). This amount of copper sulphate not only resulted in the destruction of the majority of the micro-organisms, but also brought about the death of considerable numbers of white perch. The first dead fish were noticed on Sunday, May 28, the day following the second application.

The fish killed consisted exclusively of white perch, although fish of other species are said to be present in the pond. According to data given in Whipple's "Microscopy of Drinking Water," the limit of copper sulphate application to avoid killing perch is 0.75 parts per million, an amount exceeded by about 0.1 parts per million by the combined applications of May 22 and May 27. Inasmuch as the dead fish were removed from the pond daily, no harm resulted from their deaths; in fact, the destruction of such numbers of fish may have discouraged fishermen from visiting the pond and in this way lessened to some extent the danger of contamination. It should be noted that these first two applications were made prior to the availability of accurate data relative to the capacity of the pond, and for this reason the best proportioning of the dose could not be secured.

Throughout the summer of 1922, frequent samples of the supply were collected and microscopical examinations were made by the State Department of Public Health. A study of the counts of microscopic organisms over a period of six years shows:

First, there have usually been two periods of high counts during the year, the first period occurring in May and the second in the fall, about October. Second, the predominating organisms at these times of high counts have been of the Diatom class, organisms which give aromatic odors. Third, during 1922 the spring peak was kept low, apparently by the application of copper sulphate in May. The small peak in July, 1922, was due to the presence of Monas, an organism of the protozoan type which has not ordinarily occurred in the supply in large numbers. This prevalence of Monas was evidently the effect of the copper sulphate treatment, producing the right environmental conditions for this type of organism.

Application of November 3, 1922.—The counts of microscopical organisms remained low during the summer and early fall. Samples collected during August, however, showed a marked increase in total numbers, principally Diatoms. As the numbers of organisms appeared to be increasing, it was considered advisable to treat the pond again with copper sulphate, and such application was made on November 3. Some 700 pounds of copper sulphate were used, equivalent to 0.5 parts per million (4¼ pounds per million gallons).

The effect of this dose of copper sulphate was not so marked as in the case of the second application of May 27. However, the November application resulted first in checking and finally in materially reducing the growths, so that no further tastes and odors were experienced subsequent to the treatment.

Treatment of August 14, 1923.—Frequent microscopic analyses of the supply were continued throughout 1923. The gradual increase in prevalence of organisms during the summer led to the application of 838 pounds of copper sulphate to the pond on August 14. This quantity was equivalent to 0.71 parts per million by weight, or slightly less than 6 pounds per million gallons. This treatment resulted in a distinct reduction in the numbers of organisms present in the pond water. The reduction in the numbers of Diatoms was particularly marked, although there appeared a slight increase in the numbers of green algæ and infusoria, as shown in the samples of August 29 and September 4. Samples collected somewhat later, on September 18 and 24, showed very low counts with respect to all types of organisms.

As in the case of the applications of 1922, the fullest effect of the treatment did not occur until some time subsequent to the date of application, probably because of the somewhat slow diffusion of copper sulphate throughout the entire body of water constituting the pond.

As previously mentioned, the second application of copper sulphate in 1922 was followed

RESULTS OF COPPER SULPHATE TREATMENT AS SHOWN BY REDUCTION IN CERTAIN PRINCIPAL AND TOTAL MICROSCOPIC ORGANISMS PRESENT IN CAPE POND WATER

Date 1923	Diatoms	Blue Green Algæ (Cyanophyceae)	Green Algæ	Infusoria	Total Organisms	Total Genera
Before Copper Sulphate Treatment						
North End ..... July 30.....	908	38	42	36	1,028	12
South End ..... July 30.....	1,036	32	82	16	1,166	10
Intake ..... July 30.....	878	22	52	10	962	8
North End ..... Aug. 6.....	692	48	4	4	754	10
South End ..... Aug. 6.....	392	48	2	6	448	5
Intake ..... Aug. 6.....	710	66	2	22	800	8
North End ..... Aug. 13.....	492	48	102	18	660	7
South End ..... Aug. 13.....	672	56	14	20	762	8
Intake ..... Aug. 13.....	528	64	26	14	632	7
After Copper Sulphate Treatment of August 14						
North End ..... Aug. 20.....	126	18	14	6	164	9
South End ..... Aug. 20.....	186	10	12	0	210	7
Intake ..... Aug. 20.....	170	2	8	2	180	4
Tap ..... Aug. 29.....	14	68	64	130	278	10
Cape Pond ..... Aug. 29.....	8	104	104	152	368	10
North End ..... Sept. 4.....	6	38	50	86	182	10
South End ..... Sept. 4.....	2	30	62	116	210	9
Intake ..... Sept. 4.....	4	6	40	116	168	9

August 14, 838 pounds copper sulphate, 0.71 parts per million applied.

by the destruction of considerable numbers of white perch. In 1923 no fatality occurred among the larger fish. Numerous minnows, however, inhabiting the shallow portions of the pond, were killed.

On only two occasions in 1923 did the numbers of organisms exceed 1,000 per cubic centimeter. At these two times the predominating organisms were Tabellaria and Asterionella, which do not cause unpleasant tastes and odors unless in excessive numbers. It is also interesting to note that the total numbers of organisms present during 1923 have been maintained, on the average, much lower than during any of the previous five years. The copper sulphate application of August 14, 1923, checked the tendency for increase in organisms. The experience of 1923 indicates that if the numbers of organisms can be kept below 1,000 per cubic centimeter, there will be comparatively little trouble from tastes and odors from such growths. It is true, however, that smaller numbers of certain organisms might give rise to trouble, but Cape Pond does not seem to be subject to these particular organisms.

Cost of Treatment

The cost of the copper sulphate treatment, exclusive of engineering services, was about $160 during 1922, made up of the cost of 2,045 pounds of copper sulphate at 6¾ cents delivered and of the service of one boatman on two days and of two boatmen on the third day. In 1923 the cost, exclusive of engineering, was about $65, made up of the cost of 838 pounds of copper sulphate and the services of two boatmen for one day.

Flushing of Water-Mains

During the latter part of July, 1922, complaints were received relative to the occurrence of a distinct odor and a brownish sediment in the water. These complaints were fairly well distributed over the town. At that time, the water in the pond itself contained some odor and sediment but distinctly less than that found in the water in the town. Inasmuch as the numbers and types of microorganisms present were not such as to account for this trouble, it appeared probable that this odor was the result of decomposition of the organic matter present in the water, this decomposition going on partly in the pond and partly in the distribution system. It also appears probable that the brownish sediment was due to iron rust formed by the action of the carbon dioxide upon the iron pipes of the distribution system, this carbon dioxide resulting from the decomposition of the organic matter. It was suggested, therefore, that a systematic program of flushing dead ends of the distribution system be carried out.

The first systematic flushing of the mains was put into effect upon the first of August, 1922, and a second flushing shortly after the application of copper sulphate on November 3. At the time of the August flushing, considerable quantities of sediment were flushed out of certain hydrants, particularly those hydrants at the ends of the long mains. Following both flushings in 1922, there was a marked improvement in the physical quality of the water delivered to the consumers.

In 1923, similar flushing of the mains was put into effect twice during the year, once in May and again in August. Such action appears to have prevented undue accumulation of sediment.

Results Obtained

It is stated by C. A. Wetherbee, Superintendent of the Water-Works at Rockport, that in no prior year have there been so few complaints relative to the quality of the water as during 1923. There seems to be no doubt but that the control of the algæ growths by copper sulphate and the systematic flushing of the mains have given Rockport a supply of reasonably satisfactory physical quality, and of a quality distinctly superior to that of other years, prior to the introduction of the remedial measures.

Acknowledgment of assistance and cooperation is due T. T. Hunter Harwood, Chairman of the Special Water Committee of Rockport; Charles A. Wetherbee, Superintendent of Water, Rockport, and A. D. Weston, State Department of Health.

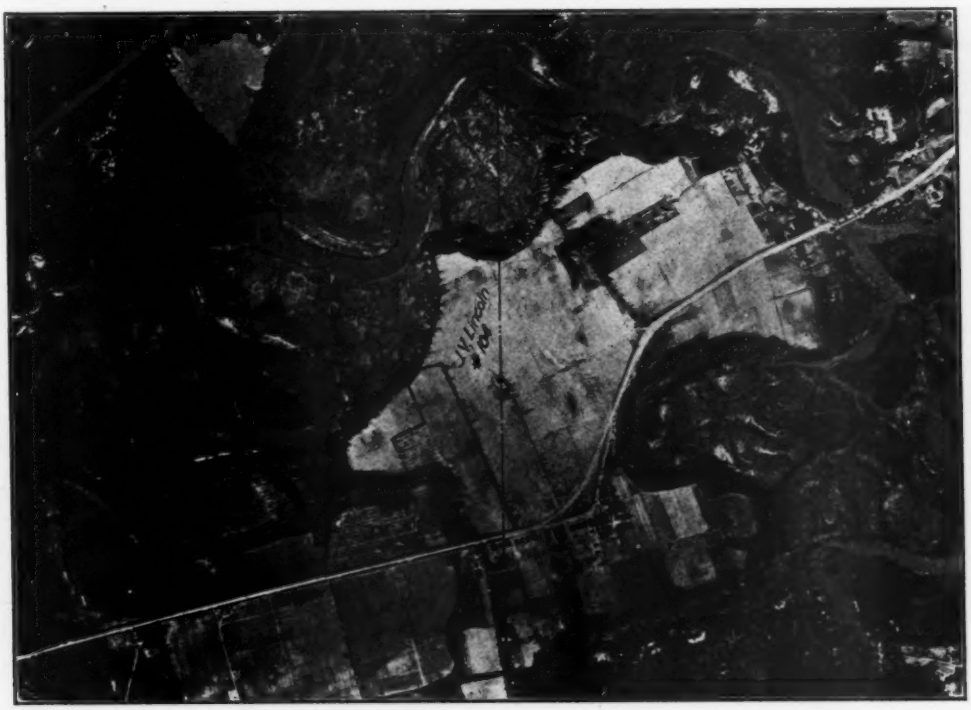
Acknowledgment.—From a paper read before the New England Water Works Association.

The Application of Aerial Surveying to Water-Supply Problems

By C. G. Krueger

THE unparalleled growth of many American communities during the past decade has presented perplexing problems to the municipal engineer. The need for increasing the water-supply is a natural outgrowth of unprecedented expansion of the many factors involved in the complete construction of the modern community.

Plans have been prepared for public consideration which reveal astounding capacities. In truly American style these quantities often exceed nine significant figures in extent. But this is a natural sequence when it is considered that huge areas at times distantly remote from



AERIAL PHOTOGRAPH TAKEN AT AN ALTITUDE OF 10,000 FEET

On section of air map at left property lines have been superimposed and parcel numbers indicated. The scale of the original photograph was 800 feet to the inch. The scale of this reproduction is 1,200 feet to the inch. Temporary detour made necessary by bridge reconstruction; also, change in alignment of highways, according to modern practice

the civic center whose water requirements are to be satisfied are required to furnish sufficient run-off to impound the estimated quantity of water in a reservoir.

The preliminary work calls for accurate surveys and maps of the area involved in the development. It is in this phase that aerial surveying finds its application. The coordination of the airplane, photographic research and engineering ingenuity have given a combination more powerful than the mere individual existence of the components, replete with possibilities, some of them recognized, many as yet unattained. It is significant to note that such an eminent authority as the late Nelson P. Lewis was highly impressed with the application of aerial mapping to city planning work.

Characteristics of Air Maps

The inherent characteristic of an air map is accuracy. Combined with the vivid and complete detail of the ordinary photograph is the record of true relation among the features. In a map of this type not an object is overlooked. Houses, cultivated fields, fence lines, wooded areas, are shown in their proper proportions. The air map is a permanent and complete record of the area surveyed.

Its value is considerably enhanced by the use of the stereoscope, by means of which it is possible to obtain, at leisure in the office, a comprehensive view in relief of the entire development. The ability to make a stereoscopic examination of the terrain is a convenience the advantages of which are quite apparent.

Cost of Aerial Maps

The cost of preparing maps by the aerial method is worthy of mention. Despite the variety of equipment required to complete an aerial survey, the procedure is efficiently correlated to provide an economical service. Extensive areas can be surveyed and mapped at less cost and in much less time than by methods used heretofore. In terms of economy, the ultimate results are not possible of interpretation in dollars and cents.

Positive Records for Claim Adjustments

In water development projects an important item to be considered is the question of land damage. The data required to prepare an estimate of cost of such damage necessitate extensive investigations on the part of the field party, the records being kept in a field book. When the system is in operation, the usual litigation on the part of the inhabitants to recover the value of lost possessions is begun. The air map is a valuable asset to the defendant at this stage by virtue of being an unimpeachable record of conditions existing at the time of the survey. In comparison to field notes, aerial photographs are unquestionably more valuable and superior in all respects in the court room. The interpretation of the former is primarily a personal matter, while the field of interpreters of air maps is limited only by the ability to visualize the features as recorded on a photograph.

What ultimate developments will occur in the application of aerial photography to varied engineering problems is not a matter of hurried conjecture. The field is fertile and it is chiefly the duty of the engineer to study the subject.

ACKNOWLEDGMENT.—Illustration by courtesy of the Airmap Corporation of America, New York.

Ten Years' Progress in Public Recreation

IN the Year Book number of *The Playground*, April, 1924, the Playground and Recreation Association of America has published some interesting statistics of progress in community recreation in the last ten years, compiled from answers to a recent questionnaire to cities throughout the country. It is shown that the expenditures of cities for public recreation during 1923 totaled $13,000,000, more than twice the amount spent during 1913. The amount issued by 33 cities in bonds for recreation purposes last year was $10,399,661, over eight million dollars more than was issued by 20 cities in 1913.

Ten years ago public recreation leadership was reported in only 342 cities. By 1923 the number of such cities had reached 680. In spite of this encouraging progress, the Association estimates that more than 400 cities of 8,000 population or over are still without a single playground or recreation leader. That cities are awaking to the economy of year-round provision for play is evident from an increase of 150 per cent in the number of workers employed during the entire year, their number having increased from 774 in 83 cities in 1913 to 1,925 in 281 cities last year. Considerable increases were also shown in the number of indoor and outdoor swimming pools and public bathing-beaches reported, proving that more and more cities are making it possible not only to keep cool in summer but to enjoy the exercise of water sports all through the year.

A question on municipal golf, included for the first time by the Association in its 1923 questionnaire, brought reports from 88 cities that they are now supplying this sport of country-club members at fees within the reach of those of very moderate means.

It is also gratifying to note that through the generosity of their citizens, 51 cities received during 1923 gifts of property for recreation purposes.

SHOWING THE BULGE IN THE BRICK SURFACE WHICH CALLED ATTENTION TO "SOMETHING WRONG" UNDERNEATH AND CAUSED THE INVESTIGATION

An Interesting Road Failure

Improperly Laid Concrete Foundation Causes Breaking of Brick Pavement

ATTENTION was called recently to several ridges which had developed at intervals in a modern brick pavement in an Ohio county. It was a brick road, just north of Bucyrus, laid not very many years ago, and otherwise smooth, except for these ridges, which ran from curb to curb across the pavement. Each ridge was about 2 inches high and not wider than one or two bricks. It was not straight across the road, but took a zigzag or crooked course.

As the filler was asphalt, the defect was puzzling to the engineers of the National Paving Brick Manufacturers Association who studied it. Had the filler been cement

HOW THE BASE LOOKED AFTER REMOVING BRICK SURFACE AND SAND CUSHION

Note the thin overlap of the concrete base

ALMOST NO EXERTION WAS NECESSARY ON THE PICK HANDLE TO PRY UP THE OVERLAPPING SECTION OF THE BASE

Note the complete disintegration of the concrete base and also the curb

grout, which is no longer recommended except where peculiar local conditions make its use advisable, one would have guessed that expansion of the surface had caused a bulge. Had there been only one of these defects, it might have received little consideration, but there were several of them in a single mile.

The state highway maintenance foreman was called on for help, and provided men and tools for the investigation. The brick surface was removed at the several places where ridges had appeared, and the sand bedding course was swept aside, revealing the concrete course. At once the mystery was solved. "Sloppy joints" in the concrete base were the cause of the trouble. In pouring the concrete for the base, it was evident that the day's run had been allowed to "peter out" to a thin edge just as the last batch of concrete had been dumped from the mixer. The next day's run started with a correspondingly thin edge pointing in the opposite direction.

During the hot weather of last summer, the base accumulated heat from day to day, getting hotter and hotter, until there was heat enough to cause pronounced expansion. With the "sloppy joint" the expansion could not be held in compression. In each instance one portion of the base started to slip and crawl up on top of the other. The further it slid up, the more pronounced became the ridge across the surface as the base lifted a course or two of brick. When a pick was inserted under the thin lip, the concrete was found to be disintegrated and was taken out with a shovel, like so much crushed stone.

Such failures occurred years ago, but if the road had been built under the National Paving Brick Manufacturers Association specifications, this trouble would not have occurred. Under "concrete base" in the printed specifications, we find the following statement:

"At the end of each working period, a bulkhead shall be placed at right angles to the center line of the roadway and perpendicular to the surface of the pavement, to which the concrete base shall be finished (not tapered out). When work is resumed, the bulkhead shall be removed and the exposed face of the concrete wetted before fresh concrete is placed."

Had the concrete base on the Bucyrus road been constructed with such joints, the difficulties described above would never have been experienced.

A NEW USE FOR STREET FLUSHERS

Los Angeles is making money in the movies by providing "canned rain" for the film factories of Hollywood. Street flushers are farmed out to film producers who need rain when there isn't any.—*Power Wagon.*

The Well-Water System of St. Petersburg, Florida

By R. E. Ludwig
Director of Public Utilities

THE present water system of St. Petersburg, Fla., is the result of years of investigation and study of the technical phase of ground water production. Formerly, the water-supply was secured from a fresh-water lake adjoining the town, but in time this proved inadequate and became contaminated, and for the past ten years the source has been deep wells.

ONE OF THE PUMP-HOUSES OF THE ST. PETERSBURG, FLA., WATER-WORKS

The ground water in this section of Florida flows in a southeastern direction, through a honeycombed limestone formation. A shallow layer of flint, immediately above this stratum, keeps the water under pressure and prevents it from rising, except where the formation is tapped with a well.

Water-Supply Problems

St. Petersburg is situated on a narrow peninsula between the Gulf and Tampa Bay, and were it not for the static pressure behind the fresh water, the salt water would enter and ruin the supply. Trouble has been experienced when excessive quantities of water have been taken from wells. The water contains sulphur, which causes objectionable tastes which it is desirable to eliminate. Another problem is present each year when the population increases from 20,000 to 75,000 for a few winter months. If the water plant were designed to supply the summer population, it would be inadequate during the winter, and if designed for the maximum population, it would be inefficient in the summer unless particularly flexible. In 1921, when it became necessary to abandon the air-lift method of pumping, the three problems to be solved in connection with our new water-works were: preventing the salt water from entering the wells; eliminating the sulphur; meeting the fluctuating demand.

ONE OF THE AERATORS OF THE ST. PETERSBURG, FLA., WATER-WORKS
Aerator in action in left background

The wells, when pumped by air, produced about 2,000 g.p.m., and even though air at higher pressure was used, additional water could not be secured. Evidently the reason was that the air was trapped in the limestone cavities

and exerted a downward pressure, so that instead of raising the water, the static was actually lowered. As the town was growing at a rapid rate, it was imperative that additional water be secured.

Extensive and thorough investigations were made of all methods of procuring underground water, most efficiently; keeping in mind salt, sulphur, and flexibility.

It was decided to purchase several vertical turbine pumps to secure flexibility and economy of operation and to construct wells to the 200-foot stratum. Below this point the water becomes salty, and in the stratum above, the water is not present in sufficient quantities.

The Well Equipment

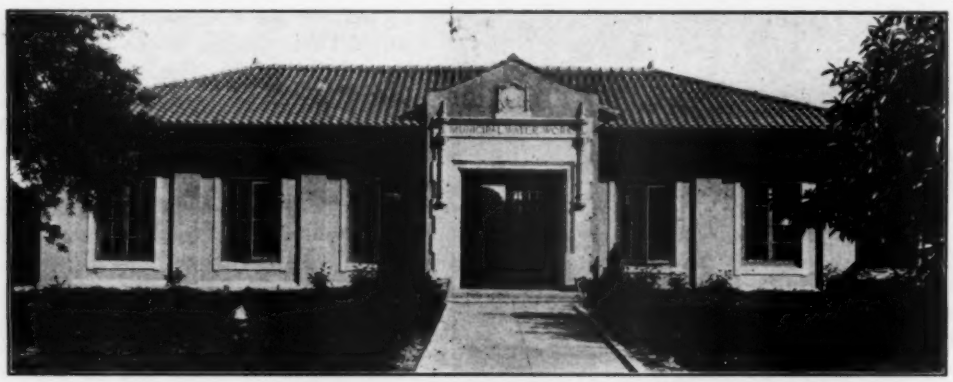
The new pumps and wells were so spaced that one well would not materially interfere with another. Each pump and well were designed to produce the desired quantity of water without lowering the water below a predetermined level. If the water were drawn below this level, the fresh water head would be lowered and the salt water would tend to enter.

The water-works is located in a residential district, so that each deep-well pump is provided with a 10- by 10-foot house, artistically designed with a green tile roof and cream paneled façades. The concrete foundation in each house supports the pump and vertical motor. The pump-bowls are set 60 feet below the surface, as it was estimated that the pumping water-level would be at that depth. The pump-shaft and the vertical motor-shaft are fastened by a flexible coupling so that the motor and pump revolve as a unit, practically noiseless, except for the hum of the alternating-current motors. As the water is pumped from the wells, it is discharged into common headers, emptying into each of the two storage basins. In order to eliminate the hydrogen sulphide gas from the water, it is aerated. The aerator consists of a series of baffle-boards, arranged to break up the water into small particles, liberating the sulphur gas. The results obtained with the aerators are excellent, as practically all the sulphur gas is eliminated after the water has passed over them and into the receiving basins.

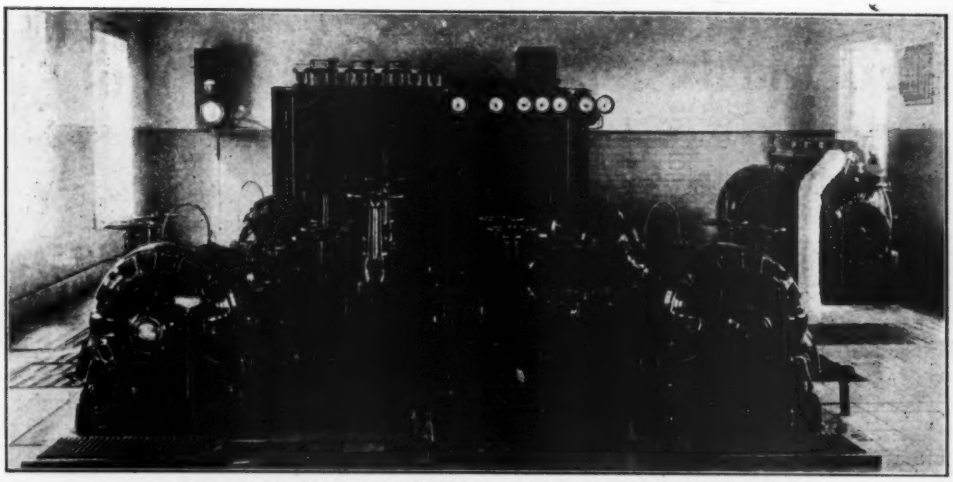
Six well units now furnish the entire water-supply for St. Petersburg. In the summer fewer units are used, but the high efficiency is always maintained.

Pressure Equipment

The service or pressure equipment is in the main pump-house. A well-designed paneled switchboard with the necessary meters and switches is located at one end of the room. A double throw switch is provided so that power can be taken either from the city power-station or from the Pinellas Power Company. Four centrifugal pumps, each of 1,500 g.p.m. capacity, pump the water from the receiving basins into the mains and an 85,000-gallon elevated tank, at 45 pounds service pressure. Between the receiving basins and the service pumps chlorination apparatus is provided, so that water is thoroughly protected from contamination. The normal operating pressure is 45 pounds, and in case of fire this is immediately raised to 90 pounds. Valves on the discharges of the pumps are arranged so that any series or parallel combination can be obtained; thus if a large quantity is needed at the normal main pressure, the pumps are operated in parallel, and when a high pressure is required, the pumps are thrown in series. Two 300-h.p. marine gasoline engines are available for fire purposes. To one of these engines is connected an electrical generator with a capac-



EXTERIOR OF MAIN PRESSURE PUMPING-STATION OF ST. PETERSBURG, FLA., WATER-WORKS



INTERIOR OF MAIN PUMPING-STATION, ST. PETERSBURG, FLA.

ity sufficient to run the six deep-well pumps. To the other engine is connected a 6,000-g.p.m. centrifugal pump which takes water from the receiving basin or, in great emergency, from the adjoining lake, thereby affording excellent fire protection.

Recent tests on the new system showed the power consumption to be 0.42 kw. hrs., per thousand gallons on the well pumps, and 0.54 kw. hrs. per thousand gallons on the service pumps, making a total of 0.96 kw. hours per thousand gallons, which results in a very efficient plant.

The vertical turbine pumps and well system were furnished and installed by the Layne & Bowler Company, Memphis, Tenn.

Light, the Policeman

MODERN street lighting, as a saver of life, a deterrent to crime, a protection for property and traffic at night and a developer of new civic and commercial centers, is shown in the report offered the City Manager and the Director of Parks of Cleveland by the engineers of the Nela Park laboratories to have a far greater value than most citizens ever realize.

Cleveland has had its attention called to the shortcomings of its street-lighting system a good many times during the last year, chiefly as the result of serious traffic accidents in such inadequately illuminated thoroughfares as lower Superior Avenue. The importance of good lighting in reducing robberies and other crimes of violence and in the development of backward neighborhoods is a good deal less appreciated generally.

Proper illumination may be made to serve as a sort of supplement to the police force in lessening crime, as the report strikingly demonstrates, although of course the 41 per cent difference in the amount of crime between well-lighted districts and poorly lighted ones is not to be taken at its face value; a good many other factors enter into that percentage. In the field of traffic, however, light does what not even a substantial addition to the police department could do in the way of saving lives and lessening the chance of accident. The charts relative to accidents on such thoroughfares as Euclid, Woodland, Superior and St. Clair Avenues are not open to challenge, like those on crime, because of the difference in the character of the neighborhoods described, and demonstrate most convincingly the relation of light to safety. Night traffic accidents and fatalities along the two of these principal avenues which are poorly lighted are out of all proportion to the traffic they bear, and the lighting unquestionably is the factor which makes the difference.

Installation of the sort of lighting system the engineers recommend as adequate would involve a considerable initial outlay and would entail also an annual expense of more than twice the sum the city spends at present on street lighting. It would save a good many lives that otherwise will be taken in traffic accidents, undoubtedly. Very probably it would also have some effect on crime statistics. The difficulty is that it is not always possible to do with available city funds things which are universally admitted as advisable and beneficial. But the recommendations are worthy of the most serious consideration.

—*Cleveland Plain Dealer.*

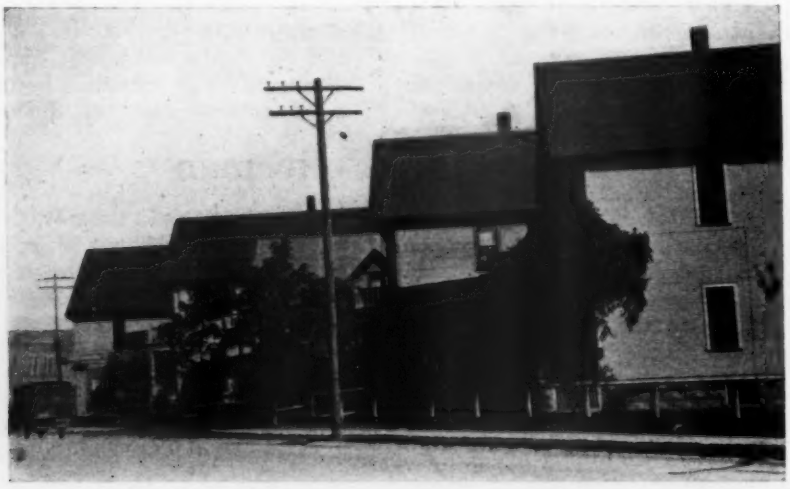
Forward Steps in City and County

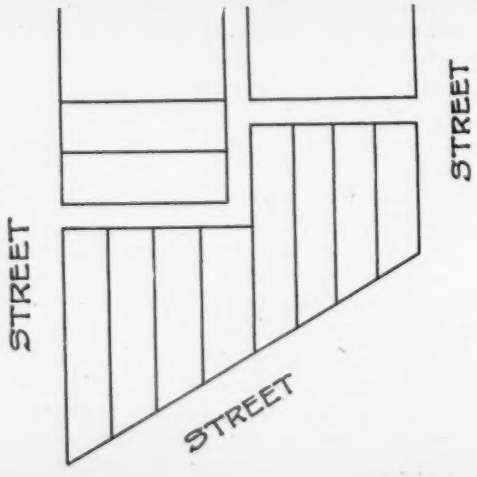
A Guide for Subdividers of Land

MILWAUKEE, WIS.—As an aid to owners, realtors and others who wish to subdivide land into lots, a Platting Guide has recently been published by the Board of Public Land Commissioners. The automobile is having its effect in Milwaukee, as elsewhere, and is fast developing areas heretofore inaccessible. The subdivision boom, started by enthusiastic realtors, has been taken up by the farmer to such an extent that those owning lands even as small as two or five acres in size wish to subdivide. The quantity, irregularity of size and shape, and non-conformity of ideas produce an almost hopeless condition.

All subdivision within, and for a distance of a mile and a half beyond the city limits must, under the Wisconsin statutes, be acceptable to the Board of Public Land Commissioners. The Board, therefore, has published a pamphlet setting forth such regulations as would be acceptable to that body. These regulations include the width of main and minor thoroughfares, the continuity of design, length and width of blocks and lots, the general requirements as to grades of streets, and other regulations necessary to proper platting.

Believing from past experience that mere rules would not, of themselves, be sufficient





The platting of lots as shown on sketch at right results in the development pictured above. Note the staggered house fronts, which are undesirable

for better platting, the Commissioners have devoted the second half of the pamphlet to suggestions for the development of a successful subdivision. Several reproductions of excellent subdivisions developed by the United States Housing Corporation, have been loaned, to show the proper use of topography. Other subdivisions illustrate how natural features may be taken advantage of for the benefit of the home owner. Following these, are several formulae intended to assist those surveyors not familiar with curvilinear layouts or proper curves for the safety of traffic, and, lastly, a map of the proposed county parkway, showing areas set aside for parks, for industries, and for residences. This may also include the proposed diagonals leading to and around the city, in accordance with the comprehensive thoroughfare plan.

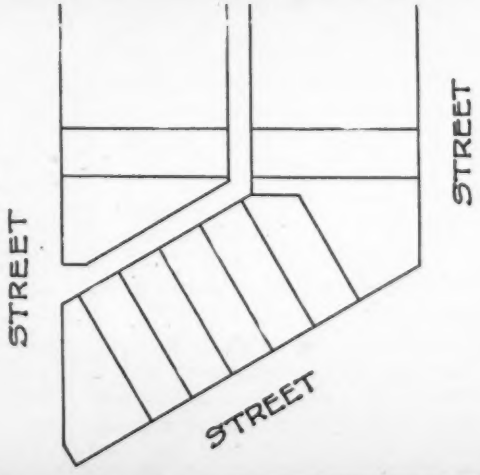
The results of this publication were immediately noticeable, and the better quality of subdivisions has already more than repaid the Board of Public Land Commissioners for its efforts.

GARDNER S. ROGERS,
City Planning Engineer.

A Flood-Prevention Program

PUEBLO, COLO.—To insure the inhabitants and business concerns of Pueblo against future losses from floods arising from the Arkansas River, the Pueblo Flood Conservancy Board has undertaken an extensive engineering program, covering the next three years, at a cost of $3,600,000. Bonds for this amount have been sold by the Board, and actual work on the project was started in January of this year.

Immediately following the disastrous flood of June, 1921, the City and County Commissioners and business men of the city secured the services of the Dayton-Morgan Engineering Company of Dayton, Ohio, to make a survey of Pueblo for the purpose of devising a feasible plan for the



A uniform set-back line is possible when side lot lines are platted at right angles to street line as shown on sketch

MOTOR-CYCLE SQUAD, PORTLAND, OREGON

protection of the city against future floods. Practically two years of engineering survey work followed, and a plan known as the Bluff Channel plan was perfected for submission to the District Court and to the citizens of the community. A hearing was conducted and a decision in favor of the adoption of the plan was rendered. Action was then taken to secure a reappraisal of property in the actual flood district and of all other property so situated as to derive a direct benefit from the proposed protective measure. This reappraisal work was carried out, and in a hearing which followed, the Board of Appraisers were upheld in their decisions on property values.

The Bluff Channel plan as adopted calls for an alteration in the course of the Arkansas River from its present channel passing through the center of the city to its natural course along a high bluff four blocks south of the present channel. This scheme will eliminate the necessity of building two levees, and, it is thought, will further aid in flood protection by allowing the river to make a straight shoot through the city instead of following the bend in the present channel. It is estimated that when the work is completed, the river will be capacitated to carry away twice the volume of water that passed through Pueblo during the last flood.

ED ORAZEM,
Pueblo Star-Journal.

Portland's Motor-Cycle Squad Does Effective Work

PORTLAND, ORE.—The motor-cycle squad of the Portland Police Department is now recognized as one of the most efficient squads of its kind in this country, and has earned a wide-spread reputation for the effectiveness of its work in recent years. The history of this motor-cycle department dates back to 1915, when the writer was appointed the first motor-cycle speed officer in the city of Portland. Reckless driving among motorists had become a serious problem for the Police Department at that time, and the motor-cycle soon proved to be an invaluable aid in enforcing traffic regulations. During the first two and a half years about 4,000 arrests for traffic violations were made, the majority of these being speed cases. Thirteen cases were appealed to higher courts, but only one case was lost during that period.

In the year 1917 eighteen additional motor-cycle police were appointed, and this squad accomplished remarkable results not only in curbing reckless driving but in answering emergency calls. At the present time there are twenty-eight members in the squad, and it is expected that this number will be increased in the near future. The men are all equipped with Harley-Davidson motor-cycles, the type of machine which we have used since the department was first organized. We find that the best service is obtained by exchanging the used machines for new ones each year, since a speed officer's machine has to stand harder wear and cover more miles in one year than is required of the average motor-cycle in a number of years.

The Portland Police Department feels that if its motor-cycle squad were eliminated at the present time, the Department would be in a critical condition. In fact, as a result of eight years' experience in this city, the writer believes that any community, whether large or small, that is not

equipped with at least one motor-cycle officer is not only neglecting to protect its citizens properly, but is losing money as well.

FRANK ERVIN, Lieutenant,
Portland Police Department.

An Annual Trophy for Local Civic Service

FORT WAYNE, IND.—A year ago the Optimist Club of Fort Wayne decided to set apart annually $100 with which to purchase a Civic Award Trophy to be presented to that citizen of Fort Wayne who during the year had performed the most valuable and unselfish service to his or her community; the selection to be made by a Board of Award, made up of one representative each from eighteen of the civic organizations of the city, as follows: Optimist Club, Rotary Club, Kiwanis Club, University Club, College Club, Exchange Club, Altrusa Club, Woman's Club League, Chamber of Commerce, Real Estate Board, Board of Park Commissioners, Council of Social Agencies, Board of School Trustees, Fort Wayne Art School, and League of Women Voters.

Nominations for the award must be sent in not later than December 31 of each year. The rules further provided that in addition to the winner of the trophy, five other persons from among those nominated should be selected for "most favorable mention."

Great public interest was excited and twenty-two nominations were made for the 1923 trophy, supported by briefs showing why the person nominated was regarded as the one most worthy to be chosen for the award. The first choice fell upon Bert J. Griswold, who for many years has been distinguished for his valuable and unselfish services to his community, although under the rules his services for 1923 only could enter into the deliberations of the Board of Award.

The presentation was made at an evening dinner, which included four hundred of the leading men and women of the city, former Vice-President Thomas R. Marshall making the principal address.

No person is permitted to receive the trophy any two years in succession. For this year it consisted of an original bronze tablet, inscribed as shown by the accompanying illustration.

COLONEL DAVID N. FOSTER.

Park Acreage of 67 Cities of 5,000 to 200,000 Population

The following table has been compiled from data furnished to THE AMERICAN CITY by the respective park superintendents:

City and State	Population 1920	Acres of Park Area	Number of Playgrounds in Parks
Lead, S. Dak.	5,013	20	8
Yankton, S. Dak.	5,024	30	..
Kalispell, Mont.	5,147	52	..
East Point, Ga.	5,241	2	2
Waverly, N. Y.	5,270	15	..
Grinnell, Ia.	5,362	30	1
Taylorville, Ill.	5,806	55	..
North Andover, Mass.	6,265	10	..
Dormont, Pa.	6,455	23	1
Newton, Ia.	6,627	7	..
Rhinelander, Wis.	6,654	10	..
Freeland, Pa.	6,666	13	2
Vineland, N. J.	6,799	40	1
Wellington, Kans.	7,048	200	2
Montpelier, Vt.	7,125	75	..
Two Rivers, Wis.	7,305	48	1
Stoneham, Mass.	7,873	9	1
Dixon, Ill.	8,191	300	3
Clearfield, Pa.	8,529	15	2
Norfolk, Nebr.	8,634	40	1
Hanover, Pa.	8,664	3	2
Rock Hill, S. C.	8,809	11	5
Sheridan, Wyo.	9,175	80	..
Watertown, Wis.	9,299	17	..
Watertown, S. Dak.	9,400	200	4
Mt. Clemens, Mich.	9,488	30	..
Brainerd, Minn.	9,591	28	6
Bowling Green, Ky.	9,638	50	10
Wallingford, Conn.	9,648	25	2
Chickasha, Okla.	10,179	41	2
Abilene, Tex.	10,274	50	1
Greeley, Colo.	10,958	100	2
Texarkana, Tex.	11,480	50	1
West Chester, Pa.	11,717	9	1
Brownsville, Tex.	11,791	5	..
Cheyenne, Wyo.	13,829	106	2
Ogdensburg, N. Y.	14,609	8	..
Pocatello, Ida.	15,001	30	2
Framingham, Mass.	17,033	92	15
Norwich, Conn.	22,304	325	2
Lafayette, Ind.	22,486	100	3
Ottumwa, Ia.	23,003	155	5
Galesburg, Ill.	23,834	110	1
Irvington, N. J.	25,480	8	1
Bangor, Me.	25,978	27	2
Fort Smith, Ark.	28,870	6	..
Norristown, Pa.	32,319	52	1
Wilmington, N. C.	33,372	23	3
Pontiac, Mich.	34,273	248	1
Austin, Tex.	34,876	20	1
Poughkeepsie, N. Y.	35,000	90	3
Williamsport, Pa.	36,198	198	2
Springfield, Mo.	39,631	200	6
Lexington, Ky.	41,534	75	7
New Castle, Pa.	44,938	20	1
Topeka, Kans.	50,022	330	4
Long Beach, Calif.	55,593	450	1
Lansing, Mich.	57 327	400	3
Racine, Wis.	58,593	228	..
Rockford, Ill.	65,651	565	7
Johnstown, Pa.	67,327	240	..
Wichita, Kans.	72,217	500	4
San Diego, Calif.	74,683	2,000	..
Lawrence, Mass.	94,270	188	7
Camden, N. J.	116,309	153	..
New Haven, Conn.	162,537	1,600	12
Atlanta, Ga.	200,616	1,000	11

Power---the Municipal Problem

Diesel Engines Replace Old Steam Equipment and Meet the Needs of Smaller Communities

By Delbert Kay

THE development and growth of municipalities, particularly those with populations ranging from 1,000 to 10,000, often involves difficult problems in the furnishing of utilities, particularly electrical energy for light and power. The first step of almost every village in an attempt to obtain the enjoyments and comforts of the city is to get electric service for home lighting. With further growth, the demand for a water system necessitates some form of power to operate the pumps. As the municipality continues to grow, the power problem becomes more difficult to solve satisfactorily, not only in regard to the cost of operation to provide current at reasonable rates, but also in furnishing a service that will be reliable in case of any emergency that may arise.

For the small community where electricity is required only for lighting at night, no serious difficulties are encountered. Usually a small internal-combustion engine will be found suitable and the investment small. When the load has outgrown the capacity of equipment of this type and the demand for power necessitates the furnishing of 24-hour service, some other provision must be made for taking care of the community's requirements. Here the real problem starts, and to solve it satisfactorily means a most careful analysis by those familiar with every phase of the question. Aside from furnishing service to take care of present needs, the question of operating costs, future expansion and the correct selection of units that will assure the utmost in efficiency are all-important points that must be carefully considered.

In following the progress of small and medium-sized municipalities one cannot help but be impressed and often surprised at the decisions made in the selection of the form of power that will best serve the community's needs. Many cities that have for years maintained municipal plants are abandoning the old service that has served faithfully and as economically as was possible under the conditions, and are resorting to a new venture—that of purchasing current. This seems to be the present-day tendency—for which there must be some reason. Has the central station anything to offer in the way of lower rates? An investigation will invariably show that this is not the case. Often municipal officials are led to believe that current can be purchased cheaper than it can be furnished by the city-owned plant. After a few months of purchased service, however, the savings that were expected usually fail to materialize. The iron-clad contracts now made by the large power companies are often misunderstood by the average city official. The meaning of the various rates, demand charges and surcharges are often more fully explained after the contract is signed and the first bills rendered.

Has the central station anything better to offer in the way of service? Many municipally owned plants are giving day-after-day service that cannot be excelled by any form of power. Purchased current brought over long transmission lines is always subject to storms and other severe weather conditions, and interruptions of supply are not unusual. These occurrences not only cause inconvenience but may prove serious, especially if the pumps for the water-supply are motor-driven. During the past winter many towns dependent upon purchased current have been without service for a number of days.

While purchased current may be suitable in some instances, there are more cases where the municipality could supply its own needs at considerable saving and with the assurance of continuity of service. Where sufficient load is available for the operation of a fair-sized unit, there is no reason why the municipal plant cannot prove profitable, providing the right kind of generating equipment is selected. It is generally believed that the water service can be furnished at a profit by the city-owned plant. If this is true, why cannot electric service be taken care of by a similar method? The opposition against municipal ownership of utilities invariably arises from a well-organized group who have their own interests at heart and not those of the community. Usually some plant is held up as a glowing example of inefficiency, but if investigation is made it will be found that the reason for this inefficiency is because of the use of equipment that is obsolete or not suited for the requirements. A plant with modern equipment is never used as a comparison.

An example of a modern municipal plant that is profitable and one that is giving good

COMPARATIVE OPERATING COSTS OF STEAM AND DIESEL PLANTS

	Costs						
Plant	Fuel	Labor	Lubr.	Suppls. Maintenance	Total Cost	Output in Kw. Hrs.	Cost per Kw. Hr.
Steam—1922	$22,368.82	$ 9,335.56	$441.70	$655.31	$32,801.39	709,190	$.0469
Diesel—1923	$ 3,651.21	$10,275.53	$405.26	$ 93.12	$14,177.02	1,132,000	$.0126

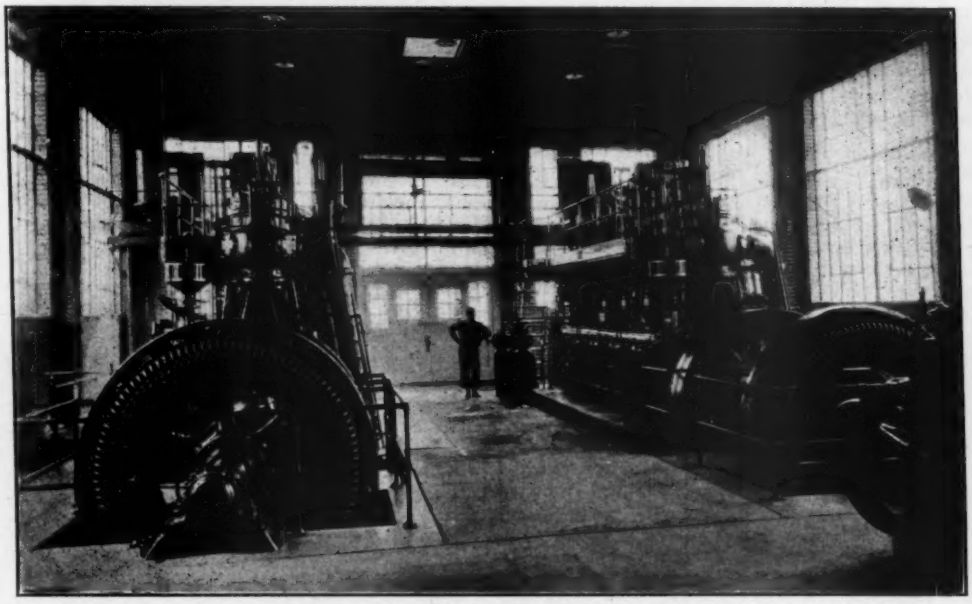
Saving in 10 months with diesel plant	$18,624.27	Percentage increase in load	45.5
Percentage saving with diesel plant	56.8	Saving in cost per kw. hr. with diesel plant	.0343
Increase in load of 1923 over 1922	322,801	Percentage saving with diesel plant	73.1

service can be found in the city-owned plant of Neodesha, Kans. This consists of two 550-b.h.p. Nordberg two-cycle full diesel engines direct-connected to 375-kw. generators. These units replace an old steam plant that had been in service for many years. The steam units were of a type similar to those usually found in municipal plants of this size and when originally installed were as efficient as could be obtained. Although the steam plant had long given faithful service, it could not be considered profitable from the standpoint of building up surplus profits to take care of future expansion.

Since the steam plant was installed, considerable progress has been made in power equipment, and efficiencies are now possible that were unheard of in the earlier days. One of the most important steps in this direction was the development of the diesel engine, a type of prime mover that utilizes the fuel directly in the engine cylinder. This eliminates many losses found in other power systems and permits an engine of moderate size to show an efficiency comparable with that of the most modern steam generating station equipped with all the latest labor-saving and cost-reducing devices.

Instead of turning to the popular "cure-all" for municipal plant troubles, that is, purchased current, the officials of Neodesha decided first to have a careful investigation made to determine what form of power would be most suitable and what would give the maximum service at lowest cost. As a result of this investigation, two diesel engines were installed. These have now been in operation for over fifteen months. The answer as to whether or not the plant is successful can best be shown in a comparison of power costs of the steam plant for 10 months in 1922 with a corresponding period of diesel operation for 1923. See table above.

When the diesel plant was under consideration, an estimate was made by the consulting engineers to determine what the probable cost of operation would be for any condition of load. The results that have so far been obtained show a close conformity to these original estimates. In order to obtain low power costs, however, it is essential that a plant operate with a favorable load factor. The higher



AN INSTALLATION OF DIESEL ENGINES AT THE MUNICIPAL POWER-PLANT, NEODESHA, KANSAS

These two 550-brake-horse-power Nordberg two-cycle diesel engines, direct-connected to 375-kilowatt generators, operate at 225 r.p.m.

the load factor, the lower the unit power costs. The plant at Neodesha is operating under the disadvantage of a low load factor, averaging only 155 kw. for the 750 kw. installed. With this load, the total cost per kw. hr., inclusive of fixed charges, is 2¼ cents, but if the load could be increased to 500 kw., the cost could be reduced to approximately ¾-cent. The size of units installed in comparison with the actual load carried was necessary owing to the peak loads the plant must carry at certain periods.

At the present time Neodesha is enjoying a domestic lighting rate of 6 cents per kw. hr. and a power rate varying from 2 to 3 cents, claimed to be the lowest in the state of Kansas. As is usually the case when an abundant supply of reliable power is available, more use is made of the service. In 1922 there were 47 street lights in use, while in 1923 they had increased to 147. A white way of 106 lights and 22 alley lights were also added, all being of 250 candle-power. Neodesha now has the reputation of being the best-lighted town in Kansas.

Since the engines were installed, the operation has been satisfactory in every way. The plant is now operating on a profitable basis and has proved a real investment for the municipality. During the 15 months of continuous service not a cent has been spent for engine repairs. This is quite contrary to the old impression that the diesel engine is expensive to maintain. With properly designed and constructed diesel units, the cost for maintenance and repairs is far less than that of a steam plant of similar size.

The municipality that is endeavoring to make its power-plant a municipal asset, one that will give dependable service at the lowest possible cost, can well profit by the experience of Neodesha. There are many cities struggling along with obsolete plants that are neither serviceable nor profitable. In such cases the diesel engine seems to offer the best solution of this vexing power problem.

Liability for Supplying Impure Water

By A. L. H. Street

AS to legal responsibility for injury sustained by a consumer of water on account of impurity, a city operating water-works is governed by the same rules of law that apply to private water companies. It was so decided by the New York Court of Appeals in the case of Canavan vs. City of Mechanicville, 128 Northeastern Reporter, 882. In the same opinion, the measure of responsibility is stated by the Court as follows:

"A private water company or a municipality is not an insurer, nor liable as a guarantor, of the quality of the water it furnishes to its customers by the customary means of pipes and faucets, and cannot be held liable for injuries caused by impure water furnished by it, unless it knew or ought to have known of the impurity. Its duty is that of exercising reasonable and commensurate care and diligence in providing an adequate supply of wholesome water at all times."

In the case above cited, the Court decided that the complaint stated a valid cause of action against the defendant city on account of typhoid fever contracted by plaintiff and his children from drinking impure water.

Similar conclusions were reached by the same court in the earlier case of Stubbs vs. City of Rochester, 124 Northeastern Reporter, 137, which was also based upon typhoid fever caused by drinking impure water.

Another leading case was decided by the Minnesota Supreme Court in 1910 (Keever vs. Mankato, 129 Northwestern Reporter, 158). In that case, the Court said:

"It is obvious that a sound public policy holds a city to a high degree of faithfulness in providing an adequate supply of pure water. Nor does it appear why its citizens should be deprived of the stimulating effects of the fear of liability on the energy and care of its officials; nor why a city should be exempt from liability while a private corporation under the same circumstances should be held responsible for its conduct and made to contribute to the innocent persons it may have damaged."

In the New Jersey case of Jones vs. Mount Holly Water Company, 93 Atlantic Reporter, 860, it was declared:

"Negligently furnishing water which is deleterious to the human body or health will furnish a valid cause of action to a customer injured by the use of the water. Actual notice or knowledge of the unwholesomeness of the water of the defendant company was not an essential element to be proven in order to establish the defendant's liability; it was sufficient if there was testimony tending to show that the defendant, in the exercise of reasonable care, might have discovered the unwholesomeness and dangerous condition of the water."

That contributory negligence is a valid defense to suits of this kind is shown by what

the Wisconsin Supreme Court said in the case of Green vs. Ashland Water Company, 77 Northwestern Reporter, 722:

"Though the conduct of the defendant be held wrongful on the ground of either fraud or negligence, if the deceased knew, or under the circumstances ought to have known, the dangerous condition of the water, yet used it with the consequence complained of, no legal liability thereby attached to the defendant. If the deceased knew, and he is charged with knowledge of what a man of ordinary intelligence under the circumstances ought to have known, then he was not deceived, whatever may have been the conduct of the defendant; and for the same reason he is chargeable with contributing to the result complained of, by his own want of care."

Cesspools versus Sewers

A Comparison of Costs

THE use of cesspools for the disposal of house sewage is quite general throughout the small communities of Connecticut. Except where conditions are unusually favorable, they are, for the most part, in very poor condition. Efforts to have them replaced by a proper sewerage system are met with protests that the cost is prohibitive.

A city of about 30,000 population with an ample supply of water, but entirely dependent on cesspools for the disposal of domestic sewage, had been having considerable trouble from the overflowing of cesspools. A firm of engineers was engaged to advise them whether to build more cesspools or to install a public sewage system. They made a very thorough investigation and their report showed:

1. The subsoil was favorable to the use of leaching cesspools.
2. Installations varied from a sewage cesspool for one or two persons to a battery of 11 serving 28. An average of 4½ persons were served by each installation.
3. Two-thirds of the cesspools had overflows through which sewage escaped when leaching through soil ceased; 25 per cent of cesspools without overflows were in poor condition.
4. Some cesspools had to be cleeaned every two weeks. A few had not been cleaned in sixteen yeears; average time of cleaning, once every 13½ months.
5. Cost of cleaning, $14.00 per year per installation.
6. The estimated cost of a sewerage system and complete treatment of the sewage was $2,665,000. The operating cost was $1,900 per 1,000 persons, $1,300 of which was for pumping the sewage to the treatment plant.
7. It was proposed to meet this cost by issuing 4½ per cent serial bonds and assessing property $1.50 per front foot and 1 cent per square foot, to be paid in ten annual installments.
8. The increase in tax rate would be:
   For cesspools $2.35 per $1,000 valuation.
   For sewers $2.30 per $1,000 valuation.

Conclusion

The cost of a complete modern sewerage system for any community is no greater than the cost of providing cesspools, and a great deal more sanitary.

ACKNOWLEDGMENT.—By courtesy of the *Health Bulletin* issued monthly by the Connecticut State Department of Health.

To Clean Up Unsightly "Back Yards" of Cities

A NATIONAL movement for cleaning up the unsightly "back yards" which cities exhibit to travelers along railroad rights of way has been inaugurated by the Industrial Division of the National Association of Real Estate Boards. A plan for eliminating objectionable rubbish in the great industrial tracts of cities traversed by passenger-carrying lines will be discussed at the Association's coming convention in Washington, D. C., June 3-6.

William Martin, of Philadelphia, is chairman of the Division's committee which is undertaking the clearing away, for travelers through American industrial cities, of the jungles of scrap-heaps and broken fences which now register as foreground for smoke-stacks and warehouses. It is expected that industrial commissioners of railroads throughout the United States will cooperate with the industrial realtors in the clean-up campaign. In outlining its program, the committee emphasizes the need for greater attention on the part of many industrial concerns to the appearance of their properties visible from the right of way. Commercial associations and civic organizations in the cities will also be asked to take an active part in making the right-of-way outlook represent their cities fairly to the traveling public, and also in enabling the traveler to identify easily the town through which he is passing by the recognition of its distinctive and attractive character.

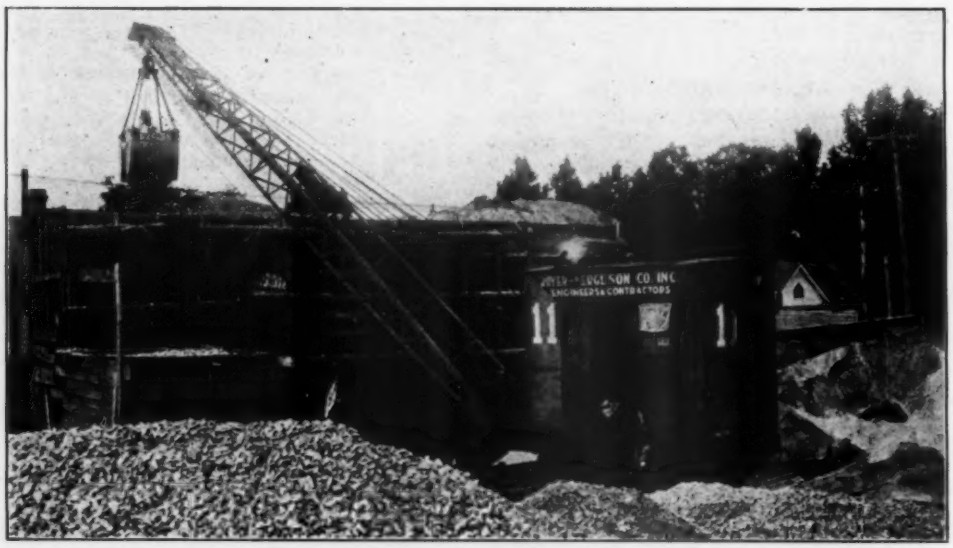
Motor Trucks and Industrial Railway Both Used on One Road Job

Long Haul Made Combination of Methods Economical in North Carolina

By R. P. Royer

Royer-Ferguson Company, Inc., Roanoke, Va.

WITH the only available shipping point one mile from the end of a concrete road job 10½ miles in length, the haulage of materials assumes the utmost importance. These were the conditions confronting the Royer-Ferguson Company, Inc., contractor for North Carolina State Aid Project No. 533, which extends from High Point toward Winston-Salem. The method adopted was to haul preproportioned batches in steel boxes on motor trucks and trailers over as much of the concrete road as was opened to traffic, and then transfer the batch-boxes to industrial cars for transportation past the new pavement to the mixer.



BROWNHOIST LOCOMOTIVE CRANE USED FOR FILLING STORAGE BINS ON HIGH POINT-WINSTON-SALEM ROAD JOB

Although the distance from High Point to Winston-Salem is approximately 22 miles, no railroad is near the highway at any place between the two cities. Materials for Project No. 533 were therefore received at a siding along the main line of the Southern Railway at High Point. Here a Brownhoist locomotive crane transferred sand and crushed stone to overhead loading bins fronting on the street, while cement was unloaded.

The contract for hauling batches from the plant to the transfer point was originally sublet on a ton-mile basis, but later the equipment was purchased and operated by the contractor. The equipment used consisted of 3½-ton Acme and Garford trucks with Troy trailers. Each truck carried three Lakewood steel batch-boxes of the tip-over type, and pulled a trailer loaded with four more boxes. Each box contained materials for a four-sack batch of 1:1½:3 concrete.

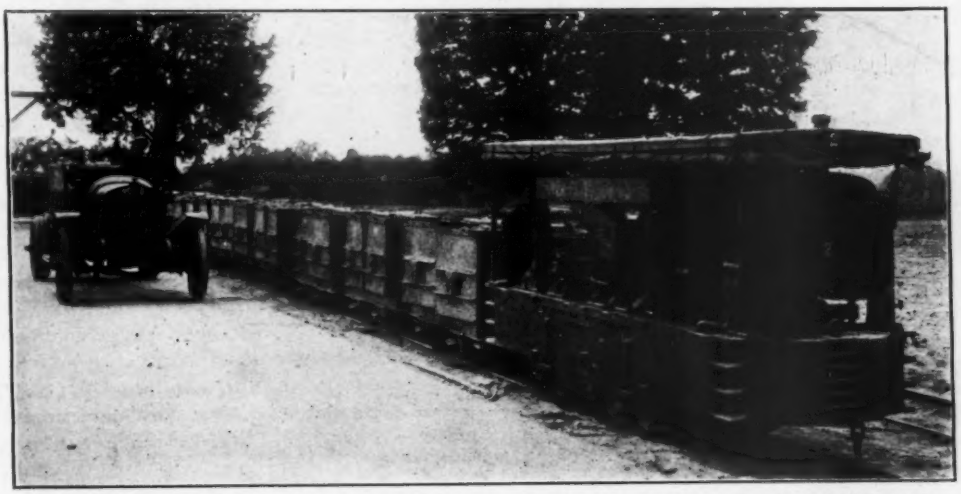
To avoid turning the trailer around, the truck-trailer unit ordinarily continued past the aggregate bins and drew up at the cement shed, where four bags of cement were placed in each batch-box on the truck. The truck was then uncoupled from the trailer and driven to the aggregate bins, where stone and sand were added. Meanwhile cement had been placed in the batch-boxes carried by the trailer. The truck now backed up to the cement house, and was coupled to the other end of the trailer, which was then pulled up to receive the aggregates.

With paved streets and the concrete road to haul over, the trucks made good time en route to the transfer station, where they

LOADING ACME MOTOR TRUCKS AND TRAILERS CONTAINING BATCH-BOXES WITH SAND AND GRAVEL AT STORAGE BINS

stopped under a light gantry crane which carried a pneumatic hoist. The gantry spanned the concrete slab and the track of 24-inch gage along the shoulder. Lifting tongs suspended from the hoist were hooked into holes at the sides of the batch-boxes, and they were quickly lifted and moved sidewise to position over an industrial car truck. When enough boxes had been transferred to make up a train load, the cars were pulled to the mixer by a Burton gasoline locomotive. Eight cars, each carrying two boxes, was a standard train; on grades—and there were several ranging from 3 to 5 per cent—this number was cut to as low as five cars.

Although the plan adopted involved an additional handling of the batch-boxes, it utilized the concrete pavement as fast as opened to traffic, and has doubtless proved economical in this instance. John D. Waldrop, Greensboro, N. C., was District Engineer in charge of the work for the state, and J. W. Mills was Senior Resident Engineer. The North Carolina State Highway Commission is headed by Frank Page, Chairman, and Charles M. Upham, State Highway Engineer.



TWO OF THESE BURTON GASOLINE LOCOMOTIVES AND ONE PLYMOUTH GASOLINE LOCOMOTIVE HANDLED THE 24 KOPPEL AND 20 LAKEWOOD INDUSTRIAL CARS WHICH CARRIED 75 KOPPEL BATCH-BOXES ON THE HIGH POINT-WINSTON-SALEM ROAD JOB

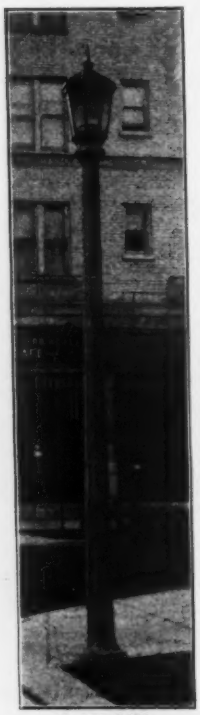
New Lighting for Sheridan Road, Chicago

By F. L. Carl
Street Lighting Engineer

AN interesting street-lighting installation utilizing asymmetric distribution of light has recently been completed on Sheridan Road, Chicago, under direction of the Commissioners for the North Shore Park District. This district comprises Rogers Park north of Devon Avenue and is one of the fastest-growing and most exclusive residential districts in Chicago. Because of its location between the city and the prosperous North Shore towns, Sheridan Road, besides having considerable local traffic, is the main artery of travel to the north.

SHERIDAN ROAD, CHICAGO, ILLUMINATED BY THE NEW TYPE OF REFRACTOR UNITS

To adequately care for this traffic problem, Robert J. Murphy, Edward J. Welch, James P. Ward, President, and Peter J. Angsten, Commissioners of the North Shore Park District, decided to widen the drive 10 feet, repave it and install a modern lighting system in place of the old gas lamps, which were of low candle-power. After careful consideration, it was decided to install Westinghouse lighting units mounted on Massey Hollowspun posts; 154 units were installed in an opposite arrangement with spacings of 120 feet. Each unit was equipped with the new Westinghouse-Holophane Bi-Lux refractor.



TYPICAL STANDARD

The lanterns are of the standard Westinghouse octagonal Senior type, made of bronze and equipped with panels of syenite glass. Within each lantern is mounted the Bi-Lux refractor, which consists of a truncated hollow cone of glass in which are pressed hundreds of small prisms so arranged that they deflect the light from the side away from the curb line back onto the street, at the same time concentrating the rays so that a maximum beam is thrown up and down the street in both directions, another beam across the street, while a third beam is spread out along the sidewalk.

The system is supplied with current by the Commonwealth Edison Company, which feeds at 2,300 volts to four 24-kv.-amp., 6.6-amp. station-type regulators, located in the Park Board Office Building at Farwell Avenue and the Lake, one block east of Sheridan Road. These are controlled by four Anderson 3,300-volt time-switches, and are so arranged that half the lights are turned off at 1 A. M. From the substation the four circuits are led through No. 8, 5,000-volt, single-conductor, lead-covered cable installed in fiber ducts to large manholes at Sheridan Road, where the cable is connected, through disconnecting pot-heads, to 5,000-volt steel-taped cable, two circuits leading north, and two circuits south.

The entire Sheridan Road improvement, including the street widening and repaving, was completed in sixty days.

Recent Changes in Chicago Paving Ordinances

Inconsequential Objections Cause Heavy Expenditures

By John B. Hittell

Chief Street Engineer, Board of Local Improvements, Chicago, Ill.

IN the proposed paving of the Maryland Avenue system of streets in Chicago the following engineer's estimate was submitted to the interested property holders and considered at the public hearing:

Concrete combined curb and gutter on cinders, gravel or sand, 27,450 lineal feet at $1.15	$ 31,567.50
Filling, 20,000 cubic yards at $2.50	50,000.00
Paving with standard asphalt wearing surface and binder course on 6 inches of portland cement concrete swept with natural hydraulic cement, 43,800 square yards at $3.50	153,300.00
Constructing 47 new brick catch-basins complete at $105.00	4,935.00
Adjusting abutting sidewalks	1,500.00
Adjusting abutting pavements	500.00
Adjusting sewer manholes and catch-basins, and constructing and connecting catch-basin inlets	23,912.00
Deficiency in interest on the assessment, cost of making, levying and collecting said assessment, and lawful expenses attending the making of said improvement	13,285.50
Total	$279,000.00

At the hearing the resolution was amended providing for "new concrete" in lieu of the new brick catch-basins, and the ordinance as submitted to the City Council contained among others, these clauses:

"The pavements abutting on each of said above specified streets, where necessary, shall be so adjusted as to conform to the surface of the finished pavement herein described."

"The sidewalks abutting on each of said above specified streets, where necessary, shall be so adjusted as to conform to the curb elevations herein described."

"Twelve new concrete catch-basins shall be constructed and trapped and connected with the sewer in Maryland Avenue, and located in the roadway of said Maryland Avenue at necessary points, adjacent to the curb lines of said Maryland Avenue."

"Each of said catch-basins shall be connected with the sewer with tile pipe of 8 inches internal diameter and shall be trapped with an 8-inch tile pipe half-trap. The inside bottom of each of the said tile pipe half-traps shall be set 3 feet 6 inches above the said floor of each of said catch-basins."

"Each of said catch-basins shall be provided with a suitable cast-iron cover, each of which covers, inclusive of lid, shall weigh 540 pounds. Each of said cast-iron covers shall be set so that the top of the same shall coincide with the surface of the finished pavement herein described."

"The existing sewer manholes and catch-basins located in said roadway shall be so adjusted as to make the top of the cover of each of the said sewer manholes or catch-basins conform to the upper surface of the said pavement; and the existing catch-basins, necessary to this improvement, located outside of said roadway shall be so adjusted as to make the top of the cover of each of the said catch-basins conform to the elevations herein prescribed. The existing catch-basins located on the line of the curb shall be so adjusted as to make the top of the cover of each of the said catch-basins conform to the upper surface of the said pavement, or to the said elevations according to whether the major part of said catch-basin lies within or without the said roadway. Catch-basin inlets shall be constructed at necessary points in said gutters. The catch-basins which are not located in the gutters shall be connected with said inlets by means of tile pipe of 8 inches inside diameter."

The estimated cost of the improvement, being in excess of $100,000.00, was referred by the Council to the Committee on Streets and Alleys, which held several hearings at which the arguments for masonry construction and concrete construction in catch-basins were presented by the different interests. The Committee reported the ordinance favorably, and it was adopted and passed by the Council.

Objections Taken to Court

The case was called for trial October 3, 1923, before Judge Hoover. The confirmation was opposed by several atorneys representing 15 per cent of the property owners. The ordinance was attacked on the following grounds:

1. The ordinance provided for adjusting existing sewer manholes and catch-basins, and constructing catch-basin inlets, the cost of which was estimated in a lump sum. The attorneys opposing confirmation attacked this provision, first, because the costs were not itemized, and, second, because the type of inlet was not specified where the existing catch-basins were not in the roadway adjacent to the curb and could not be used directly as inlets. Therefore, a type of inlet known as a grate or gutter box was to be used and connected to the catch-basin. Opposing attorneys then called the attention of the Court to the fact that the grate type of inlet was not directly provided for in the ordinance, and material for its construction was not specified, and provision for its connection to existing sewers, if there were any, was not shown.

2. These attorneys also contended that the elevation of the 8-inch tile pipe connection from new catch-basins should be shown at a point of connection with the sewer in streets and the location of new catch-basins shown; and further, that the ordinance should show a connection down-

ward to the sewer; the elevation of catch-basins being known, the elevation of the sewer should also be known. The attorney for the city contended that exact locations could not be shown, because a period of one year to two years might elapse between the time the estimate was made by the engineer and the time the street would be paved. Also, some obstruction, such as a public utility conduit or water pipe, might interfere with the location of a catch-basin as definitely fixed in the ordinance.

I will cite some excerpts from Judge Hoover's decision in which he dismissed the petition:

"There were a number of objections, of course, filed in this proceeding, but the objections argued and relied upon were those aimed at the validity of the ordinance itself for the purpose of defeating, if possible, the entire improvement as provided for in the ordinance.

"Taking up the objections, in a general way, in the order in which they were argued, there was, first, the objection to the proceedings of the Board of Local Improvements at the public hearing. The evidence shows that the original resolution of the Board of Local Improvements providing for this improvement, together with the engineer's estimate, was, so far as specifications were concerned, a duplicate of the provisions of the ordinance, except that at the public hearing a motion was made, which, in substance, was to change the material used in the construction of the new catch-basins, or in the construction of catch-basins, from brick to concrete. There was no provision made in the motion as to what the specifications should be as to size, shape or dimensions of the new catch-basins, and it was urged that inasmuch as the motion was merely to change the material to be used in the construction, no dimensions of the catch-basins as proposed were given, and that the property owners at the public hearing had no means of knowing what was proposed to be done as to size and location, and so forth, of the proposed new catch-basins.

"I think it may be safely assumed, in view of the fact that the original resolution provided specifically as to what the size and shape and dimensions of the catch-basins which were to have been made of brick should be, and that the resolution or motion made at the public hearing made no reference to any change of size or dimensions except a change of material to be used in the construction, that the property owner had a right to go away from the public hearing assuming that the only change made at the public hearing was that instead of being constructed of brick they were to be constructed of concrete. That was the only amendment to the original resolution that was made at the public hearing.

"Now, it is contended, sections 7 and 8 provided that there must be a new resolution or an amendment which is before the property owners at the public hearing, but I think in view of all the authorities on that question that the motion which was carried by the Board is, in itself, sufficient, but the difficulty with it is that after amendment was made in pursuance of the resolution, the engineer who made the amendment in compliance with the resolution changed somewhat the dimensions of the catch-basins as provided for in the original resolution. The original resolution provided for a wall in catch-basins 8 inches thick. The amendment made to that resolution provided for a wall in catch-basins 5 inches thick and a depth of 7 feet instead of 7 feet and 2 inches. It is contended that these changes constituted a variance which was fatal to the ordinance. If this were the only question involved, this Court would be inclined to hold that variance was not a material variance, at least not of sufficient importance on that one proposition to invalidate this ordinance. But that is not the only objection urged. I might suggest that it seems to me that to strictly comply with sections 7 and 8, there should be, if there are any changes in the original resolution—I believe the spirit of the statute is that the property owner at the public hearing must know and has a right to know at that public hearing just what those changes are going to be. If it is a change in material, if it is a change in dimensions, if it is a change in location, or any other changes, the motion or resolution should specifiy what they should be.

"I refer now to the opinion of the Supreme Court in the case of Bloomington vs. Davis. There are some similarities and some differences between the ordinance in the Bloomington case and the ordinance in this case. Reading from the Bloomington case:

> One objection is that the ordinance provided for five cast-iron sewer inlets, which shall be constructed flush with the face of the curb and gutter; said inlets shall be connected with the public sewer by the means of 12-inch vitrified clay sewer pipe. [This] does not sufficiently describe the location of that portion of the improvement. The ordinance also provided that the inlets shall be connected with the sewer at the manholes therein, and that the sewer pipe connecting these inlets with the public sewer shall be laid on a uniform grade with not less than ¼-inch fall for each foot in length from the point of beginning to the connection with the sewer.

"The ordinance before us in the Maryland Avenue case has a general provision that the connection shall be made with the sewer of each of the streets respectively, and you might infer from the reading of the ordinance, although there is no allegation particularly to that effect, but such an inference could be drawn from the general language, that there are sewers in certain of these streets, but the ordinance and the resolution in this case, as well as in the Bloomington case, do not give the location of the sewers. It is impossible to determine from any of the proceedings in this case where the sewers are located, except from a plat which was introduced in evidence during the hearing of the case. It is contended by the objectors here that it is incumbent upon the city in preparing this ordinance—upon the engineering department—to state what the length of these drains shall be and what the grade shall be at which they are to be laid, and the location of the catch-basins. In this case there is nothing said relative to grades, nothing to indicate the location of the sewer, whether it is in one part of the street or another, and nothing to indicate the location of the manholes, except left to the discretion of the engineer. In that respect it is parallel with the Bloomington case, except that the ordinance in the Davis case does provide what the fall of the pipe shall be from the catch-basin to the sewer—¼ of an inch for each foot. This does not make any provision as to whether the pipe shall run up-hill or down.

"It is contended on the part of the city that some of these objections are somewhat hypercritical, and that certain things must be left to the discretion of the engineer, and to what the Supreme Court has been pleased to term the 'exigencies of construction,' and that in the actual improvement they run across conditions when excavations are made which cannot be foreseen, and that, therefore, to describe the exact location of these sewers, the exact grades, the exact location of these catch-basins, would be, if not an impossibility, an impracticability. It is urged, however, on the part of the objectors that that theory is disproved by the facts in this case, because during the hearing of this case a plat was prepared which set forth the grades and all of the matters for which substantially an objection had been raised. In other words, the question of the location of the sewers, the question of grades and all these questions, are things that are peculiarly within the knowledge of the petitioner. The fact that they prepared that during the hearing, it is insisted, should be deemed by the Court as some evidence that these grades could be established and all these matters ascertained prior to the inception of the proceeding with just as much accuracy and just as much detail as they can during the hearing.

"Trying to take as broad a view as the Court can of the situation, in view of the tendency of the decisions of the Supreme Court within late years toward requiring full specifications as to the kind, character and location and so forth of the improvements, it does seem to me that this knowledge being within the knowledge of the city (they have their map department and their records as to where all these improvements are) can substantially comply with the ruling of the Supreme Court on these matters. Let us assume that you did in your ordinance provide with certainty that certain things in an improvement, as, for instance, a catch-basin or other component part of the improvement, shall be located at a certain place, and when you begin excavating there you find, by reason of underground work or other obstacles, you cannot locate it at that particular place, it must be changed somewhat, and in that respect varies from the provisions in the ordinance as to the location or the shape or the style provided in the ordinance, it seems to me that the Local Improvement Act provides for that, because, if your ordinance provides that a thing shall be of a certain size or shape or should be located at a certain specific spot, and you find it is impossible as a matter of construction to place it there as provided in the ordinance, under section 84, when you apply to the Court for a certificate of completion, the law providing that upon a showing that the work has been done in substantial compliance with the statute, allows the room for this discretion in the method of construction which it is contended on the part of the city the engineer of the Board of Local Improvements should have. Because, if you show in your application for final certificate, and somebody objects that a manhole or catch-basin is not placed where the ordinance provides, and you show in making that improvement you ran upon water pipes or some other obstacles that prevented your putting it there, can you imagine any court in the world that would refuse to give a certificate of final completion as a substantial compliance when it is shown to the court that as an engineering proposition it is impracticable to place it the same as the ordinance provided? So, it does not seem to me, after going into these authorities thoroughly, that it is the intent of the Supreme Court or the Legislature that these matters of discretion should be left with the Board of Local Improvements or with the Engineering Department in the ordinance, but that it is a matter of discretion that might arise where by force of circumstances or necessity there was necessarily some discretion used, where they made some slight variance from the provisions of the ordinance.

"Now, speaking about this question of discretion and the impossibility of doing certain things on the part of the city, the Supreme Court has already passed upon that subject in 183 Illinois, only in a general way, yet, it indicates what the law of this state is, and the language of the Supreme Court is this in that case:

> For this reason it is said that the improvement cannot be described but its character must depend upon the exigencies of construction. The obvious answer to this is that if the city is not able to specify the nature, character, locality and description of the improvement, it is not authorized to make it by special assessment at the expense of the property owners. The Legislature has fixed the conditions upon which the special assesment may be levied.

"I might go ahead and say a good many things about these inlets, about the provisions for connecting the drains to the catch-basins, about the question of whether or not these drains from the catch-basins to the sewers are provided for and how they are provided for, but this ordinance does not say—it says the drains shall lead from the catch-basins to the sewer, but does not say whether you shall take a maul and knock a hole in the pipe or connect them with Y's. All those things, in my judgment, should be provided for. I think there is no need of saying anything upon the question of the reasonableness of this improvement. I think it is reasonable and I think it is an improvement that is badly needed, but that will not cure the ordinance."

Attempt to Overcome Court's Objections

In consequence of this drastic opinion, a conference was held between the attorneys and engineers of the Board, at which the former contended it would be useless to go into Court unless the estimate and ordinances were considerably more in detail than they had been in the past, especially with reference to the items of sewer adjustment work, sidewalk construction and adjusting of abutting pavements.

Realizing that it is almost an impossibility to visualize in advance just the necessary amount of work to be done at street and sidewalk intersections, it was determined that all reference to these operations should be omitted; and any cure, if necessary, should come from a collateral ordinance requiring the Commissioner of Public Works to adjust the walks and pavements at intersections, and pay the same from the general maintenance fund of the city.

ENGINEER'S ESTIMATE OF COST OF IMPROVEMENT

Asphalt pavement with foundation	4,520 square yards	@	$ 4.00	$18,080.00
Concrete curb and gutter with foundation and backfilling	2,730 lineal feet	@	1.25	3,412.50
Cutting	3,085 cubic yards	@	2.50	7,712.50
New concrete catch-basins complete	4	@	105.00	420.00
Catch-basin inlets complete	14	@	40.00	560.00
8-inch tile pipe catch-basin connections	220 lineal feet	@	3.00	660.00
Sewer manholes adjusted	9	@	9.00	81.00
Sewer catch-basins adjusted	14	@	40.00	560.00
New iron covers	14	@	30.00	420.00
Deficiency in interest on assessment, cost of making, levying and collecting said assessment, and the lawful expenses attending the making of said improvement				1,594.00
Total				$33,500.00

To meet with the other objections, a copy of an estimate and extracts from one of the recent ordinances will show how this is attempted to be done.

"Four new concrete catch-basins shall be built, trapped and connected with the sewer in the center of said North Neva Avenue and located in the roadway of said North Neva Avenue adjacent to the curb lines at points as follows: two 60 feet south of West Grand Avenue and two 60 feet north of Palmer Street.

"Each of the catch-basins herein provided shall be cylindrical in shape and shall have an internal diameter of 4 feet, excepting the upper portion 2 feet and 6 inches in height, which shall be conical in shape, being reduced to 2 feet internal diameter at the top. The wall of each of said catch-basins shall be 5 inches in thickness and shall rest upon a floor of pine plank 2 inches in thickness, which shall be covered with a layer of concrete 3 inches in thickness. Each of said catch-basins shall be 7 feet and 6 inches in depth, measuring from the top of the concrete wall to the top of the concrete floor.

"Each of said catch-basins shall be trapped with an 8-inch tile pipe half-trap. The inside bottom of said half-traps shall be set 3 feet above the said floor of each of said catch-basins. Each of said half-traps shall be connected in a direct line, which shall slope downward, to the sewer herein specified by means of tile pipe of 8 inches internal diameter.

"The elevation of the center of the said 8-inch pipes where they connect with the sewer at said point 60 feet south of West Grand Avenue shall be 59 feet above said Chicago City datum, and at said point 60 feet north of Palmer Street shall be 64.20 feet above said Chicago city datum.

"The existing catch-basins located in the sidewalk space adjacent to the curb lines of said North Neva Avenue shall be so adjusted as to make the top of the covers herein provided for said catch-basins conform to the top of the adjacent curb. Each of said catch-basins shall be provided with a suitable cast-iron cover, each of which covers, inclusive of lid, shall weigh 315 pounds.

"A catch-basin inlet shall be constructed in the gutter adjacent to each of the existing catch-basins. Each of said inlets shall consist of a suitable cast-iron grating 21½ inches by 14½ inches, weighing 90 pounds, supported in a suitable cast-iron frame weighing 190 pounds, set upon a concrete foundation composed of 1 part of portland cement, 3 parts of clean torpedo sand, and 5 parts of crushed stone or gravel.

"The concrete foundation for said inlets shall be 36 inches in depth, 25 inches in width, and 38 inches in length, with a suitable opening through the foundation connecting the grating with the 8-inch tile pipe hereinafter provided leading to the adjacent catch-basin.

"Each of said inlets shall be connected with the adjacent catch-basin by means of tile pipe of 8 inches internal diameter. The center of the 8-inch tile pipe at its connection with the opening in the foundation shall be 33 inches below the top of said grating, and at the connection with the catch-basin shall be 45 inches below the top of the cover of the said catch-basin.

"The top of said cast iron gratings shall conform to the upper surface of the gutter immediately adjacent."

It would seem, at least to one whose education is not along legal lines, that the courts have laid stress on the need of furnishing detailed information to the property holders—information which a great majority of them are incapable of appreciating; or, if understood, the value of it is very questionable. Yet it must be taken into consideration that a law that places the power practically in the hands of six men in the city of Chicago to levy additional taxation of 10 to 12 million dollars a year upon the property holders should be such as to safeguard every right of the latter.

I am of the opinion that the present laws must soon be rewritten in order to obviate the effect of inconsequential objections to specifications.

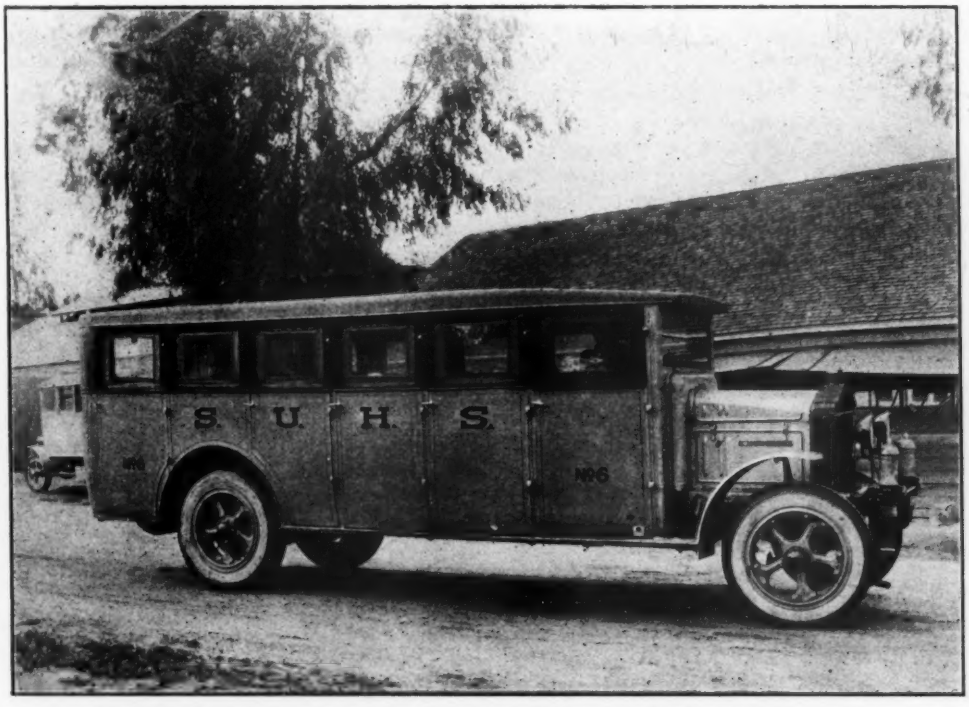
Oil-Burning Equipment in Wilmington Water-Works

IN the last month of the fiscal year 1921-22, the water department of Wilmington, Del., installed an oil-burning equipment under two boilers in combination with an oil pump in duplicate and a reservoir tank of 15,000 gallons.

The fuel cost, with oil at 4 cents per gallon and coal at an average price of $6.91 per ton of 2,000 pounds, is in favor of coal. This is based on the amount of work done or the amount of water pumped by coal compared with the water pumped by oil. Thus, the average for the year was 1,000,000 gallons of water pumped for $6.61 of coal, whereas 1,000,000 gallons was pumped with $7.58 of oil. In June, 1923, the price of oil went to 4.9 cents per gallon, but in July it dropped to 4½ cents, and it is still too high to displace the use of coal entirely and can only be considered as a temporary substitute.

Protection and Transportation for Cities Through Motor Vehicles

TESTING AN AMERICAN-LAFRANCE TYPE 12, 1,000-GALLON-CAPACITY TRIPLE-COMBINATION AT ANCHORAGE, ALASKA



GARFORD BUS USED BY THE SANGER UNION HIGH SCHOOL, SANGER, CALIF.
We are indebted to S. McCarteney, Chamber of Commerce, Sanger, Calif., for this photograph

The Use of Iodine in Public Water-Supplies

When Goiter Is Endemic, Is It More Economical to Treat the Whole Water-Supply or the Individual Consumer?

By J. W. Ellms

Engineer of Water Purification and Sewage Disposal, Water Department, Cleveland, Ohio

THE treatment of public water-supplies with salts of iodine as a preventive of simple goiter has been recently suggested, and in at least one instance has been tried in the water-supply of a large city. The prevalence of simple goiter in certain districts has long been recognized, but the cause for its continued presence in these localities has been established only within the last twenty-five or thirty years. Iodine appears to be necessary for the normal functioning of the thyroid glands. A minimum percentage of about 0.1 per cent seems to be required for the maintenance of normal or colloid gland structure. The iodine is present as tri-iodo-indol-propionic acid. The substitution of either of the other halogens, chlorine or bromine, for the iodine in this acid produces a stable compound, but one that is devoid of physiological activity.*

Goiter is a disease which affects not only human beings, but animals as well. Fresh-water fish develop this condition at times, and the first practical application of iodine in the prevention of goiter on a large scale was its use in fish hatcheries in Pennsylvania in 1909. The prevalence of goiter among adolescent girls and among women during pregnancy is well known, especially in those areas now recognized as endemic goiter districts.

Since the cause for this disease is a lack of natural iodine intake, it is of interest to learn why there should be a deficiency of iodine in some localities, and, in consequence, it should be present only in extremely small amounts, or not at all, in the food and water of these regions. Dr. Emery R. Hayhurst† has shown that of the four halogens, iodine is by far the rarest in natural distribution; but that it may always be found in sea water, where it is present in an amount equivalent to 0.01 gram of sodium iodide (NaI) per liter. It is also present in considerable amounts in sea plants such as the giant sea-kelp. The commercial sources of iodine are from Chili saltpeter and from sea-kelp.

Iodine is usually found as sodium iodide, a salt which is very soluble in water, being more than five times as soluble as common salt. This high solubility probably accounts for its practical disappearance from inland salt brines, or salt deposits, and for its occurrence in sea water. Constant leaching out of salt deposits, and the carriage of this highly soluble salt to lower levels, and finally into the sea, have largely exhausted this compound from our soil and natural waters.

Since the natural inland brines and salt deposits do not furnish us any iodine, and since, even by the method of manufacturing salt from sea water, the soluble iodine salts are lost in the evaporation process, Dr. Hayhurst concludes that "land animals, including man, have no dependable source of iodine in the salt derived from inland sources, which produce about 96 per cent of our total salt supply," and that "irrespective of whether it is derived from inland sources or from sea water, salt is not at present a source of iodine."

It is therefore apparent that if iodine deficiency in our diet is not now cared for naturally, it must be supplied artificially; and that in doing so we shall be able to prevent simple goiter, now prevalent in so many parts of the world. Whether this deficiency shall be supplied wholesale through our water-supplies, through salt as a condiment, or through direct treatment of individuals, is a matter both of efficacy and cost.

So far as the writer can learn, iodine or its salts are now made only commercially to meet the demands of the pharmaceutical and chemical trade. As prepared, sodium iodide will contain from 5 to 6 per cent of water, and the average purity of the salt will run over 99 per cent sodium iodide (NaI). The price in lots of 25 pounds and over is about

* Dr. O. P. Kimball, Journal American Public Health Association, page 81, February, 1923.

† Dr. Emery R. Hayhurst, Bulletin Ohio State Department of Health, on "The Present-Day Sources of Common Salt in Relation to Health, and Especially to Iodin Scarcity and Goiter."

$4.25 a pound at point of shipment. This is the compound that would have to be used in our public water-supplies, if their iodine content is to be increased.

Treatment of Rochester Water-Supply

To the courtesy of Beekman C. Little, Superintendent of the Water Department of Rochester, N. Y., the writer is indebted for the following information concerning the results of the latest treatment of that city's water-supply. This is in addition to the information supplied in Mr. Little's paper which appeared in the July, 1923 issue of the *Journal* of the American Water Works Association. During the present year, between September 11 and October 2, there were supplied to the Rochester water-supply 16.6 pounds of sodium iodide daily, or an amount which is equal to 0.664-pound per million gallons. Assuming that this represents a salt containing 94 per cent of NaI, it is equivalent to applying about 75 parts of sodium iodide per billion parts of water.

The method of applying the sodium iodide consisted in placing the salt (16.6-lbs.) in a bag, and suspending it in the water back of a dam and just before the water entered a reservoir. The salt was dissolved in a few minutes, and consequently the entire dose for the day passed into the reservoir in these few minutes, and was diffused through the water on its way to the distribution mains in the city about ten miles distant.

It was found that the quantity of sodium iodide reaching the taps in the city rose gradually from 4 or 5 parts per billion to 50 parts per billion between September 11 and October 2, when treatment was discontinued. From October 2 until October 19 it gradually fell off, reaching its original iodine content on the latter date. An amount equal to 50 parts per billion was maintained for only four days, and an inspection of the curve would indicate that the average amount was not much more than 30 parts per billion.

It is thus apparent that the dosage was not much more than 67 per cent efficient at the maximum, and probably not more than 40 per cent efficient on an average. The normal content of sodium iodide in the Rochester water, according to their determinations, ranged from 1 to 4 or 5 parts per billion. The quantity of water used daily in Rochester is aproximately 25 million gallons.

To provide a treatment of 75 parts of sodium iodide per billion in the Cleveland water-supply, where on an average about 150 million gallons are used daily, it would require the application of practically 100 pounds of NaI each day. If this treatment were to be carried on for 30 days each year, the amount required would be 3,000 pounds, which at a price of $4.25 per pound, exclusive of freight, would amount to a cost of $12,750 per year; or a cost for the chemical alone of $2.83 per million gallons of water treated.

Professor George C. Whipple states that about 1.5 quarts of liquid are consumed per day by the average person, of which one-half may be assumed to be water and the rest tea, coffee, etc. As water is, of course, used in the preparation of practically all foods, we may assume that the iodine content of approximately one gallon of water per day might be consumed per person. Assuming that one million people would use one gallon each for drinking and preparation of food, then one million gallons of water, or 0.67 per cent of the average amount supplied per day to consumers in Cleveland, would be actually needed for iodine treatment.

If 75 parts per billion of sodium iodide were actually present in the water-supply, it would be equivalent to approximately 0.0044 grain per gallon, which each person would receive in the one gallon of water presumedly utilized. If less than 1 per cent of the total quantity of sodium iodide applied to the water-supply is really utilized, it would seem to be a decidedly wasteful method for producing the results desired.

The chlorine applied to practically all water-supplies at the present time would have a tendency to decompose the sodium iodide introduced into a water and to liberate iodine. While this element would not be lost, its combination with organic matter or its reaction with other mineral constituents might adversely affect its therapeutic value. It therefore appears to the writer that it would be far more effective and much less expensive to treat the individual directly for simple goiter, than to attempt the medication of an entire water-supply.

ACKNOWLEDGMENT.—From a paper read before the Ohio Conference on Water Purification, at Columbus, Ohio.

Some people are afraid of the effect of the chemicals used in water purification. Such apprehension is groundless. The chemicals that are used to cause settling go to the bottom and practically never get into the water again. The amount of chlorine added, while sufficient to kill germs, is only about one part in a million parts of water—so little that it cannot possibly harm anyone.

—Dr. Matthias Nicoll, Jr., Commissioner, New York State Department of Health.

The Community Bathing-Beach in Aurora, Illinois

By Joseph C. Winslow

ONE of the largest outdoor swimming pools in the country was erected in 1923 at the Central States Fair Grounds on the Lincoln Highway between Aurora and Geneva, Ill. The pool itself is not owned by the fair association. It was financed by the Community Swimming Pool, Inc., with a capital stock of $75,000, shares being sold to the general public at $25. The fair association receives revenue from the income of the pool.

The concrete pool, measuring 320 x 166 feet, was built by the Ornamental Concrete Company, of Aurora. Surrounding the pool there is 1,200 square feet of sand beach, making the measurement of the entire beach 537 feet by 376 feet. The sand is 18 inches deep. The water capacity of the pool is 1,250,000 gallons.

At the south end of the pool are bath-houses with locker accommodations for 2,000 people. Towels and bathing-suits, freshly laundered each time they are used, are supplied to the bathers.

Water for the pool is supplied by an artesian well on the grounds. Before entering the pool the water is passed through the recirculating and refiltering system, manufactured by Graver Corporation, East Chicago, Ind., where it is filtered and sterilized to remove suspended matter and bacteria. This system consists of two vertical pressure filters, each 10 feet in diameter by 9 feet 4 inches high, using a filtering medium consisting of two layers of crushed quartz above two layers of graduated-sized gravel. The filters have a capacity of 28,260 gallons per hour, based on a rate of 3 gallons per square foot of filtering surface per minute; one alum pot for introducing alum into the water; one Wallace and Tiernan chlorinator, and one 6-inch centrifugal American Well Works pump having a capacity of 28,500 gallons per hour.

Recirculating Equipment

The water is pumped from the artesian well by means of a 10-inch deep-well American Well Works pump into an elevated storage tank. The water then flows by gravity through an 8- x 4-inch Venturi tube and then filters into the pool. When the pool is full, water from the tower is shut off, and circulation is commenced by placing the 6-inch centrifugal pump in operation.

Water is withdrawn from the deep end of the pool, forced through the Venturi tube and filters, then returned into the shallow end. Before the water passes into the filters it is mixed with alum, which is introduced at the Venturi tube, the proper mixture being controlled by means of a needle valve located on the ½-inch supply line to the alum pot. Alum is introduced to increase the efficiency of the filters by forming on the top of the filter bed a gelatinous mat which removes minute particles that might otherwise remain in the water.

After passing the filters and before entering the pool, the water is treated with chlorine. Bacteriological tests show an exceptionally sanitary condition of the water at all times.

The cost of operating a pool by this recirculating and refiltering method shows a definite saving over that of the older draw-and-fill method, by which the entire contents of the pool are withdrawn at stated intervals. Another point in favor of the recirculating system is the fact that pollution is always kept at a minimum, while with the draw-and-fill method it is cumulative and often becomes excessive.

Other pools operated like the Aurora pool and with like results include the Cascade pools at Birmingham, Ala., and Nashville, Tenn.; the pool at Dreamland Park, Newark, N. J.; the municipal swimming pool, Memphis, Tenn., and the one at the Tri-State Fair Grounds, Danville, Ill.

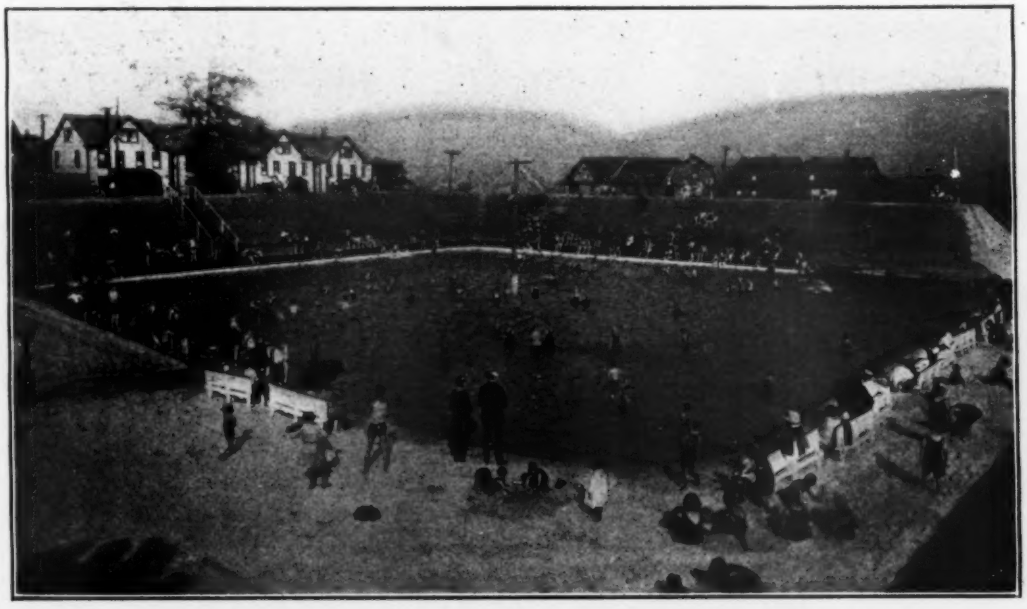
EDITORIAL NOTE.—For a view of the recirculating and refiltering system of the community swimming pool in Aurora, Ill., see article on "The Design of Swimming Pools as to Operation and Sanitation," by Jack J. Hinman, Jr., page 357, in the April, 1924, issue of THE AMERICAN CITY, with a brief description of this method of removing suspended matter and bacteria.

Municipal Reservoir Converted into Swimming Pool

By S. B. Taylor
Commissioner of Parks and Public Properties, Altoona, Pa.

WHEN a municipal reservoir is no longer required by the city, or when it is condemned for any other reason, it can still be put to excellent use, as was demonstrated in Altoona last summer. For years the people of Altoona had felt a growing need of a municipal swimming pool affording clear, sanitary water and protection to the life and health of bathers. Last summer such a natatorium was provided when the old municipal reservoir was converted into a modern concrete swimming pool. Previous to that time the only places available for swimming had no supervision to prevent accidents and the sanitary condition of the water was usually of questionable character.

The actual construction of the pool was undertaken by the city. The cost was $14,000, including the bath-house. The pool is under the supervision of the Park Commission, and a constant flow of water from the city mains insures a clear, pure pool at all times. A further safeguard on sanitary conditions is provided by laboratory tests made at frequent periods. The pool is 120 feet square, with depths ranging from 18 inches



MUNICIPAL SWIMMING POOL, ALTOONA, PA., FORMERLY A CITY RESERVOIR

to 7½ feet. A beach of clean white sand is provided at the shallow end. The accompanying photograph shows the sand beach and the sloping walls of the old reservoir.

The bath-house provides sixty dressing-rooms in the wing for men and thirty dressing-rooms on the women's side. Between the two wings are located the ticket office, check room and lunch room. Bathers are required to provide their own suits. Eight employees, including a manager, five life-guards, and attendants for the women's and men's dressing-rooms, insure proper supervision and protection against accidents.

A charge of 10 cents is made for the use of the pool, dressing-rooms and check room by children; 20 cents for adults, and 10 cents for spectators. From 9 to 12 A. M., the pool is reserved for playground children, but during the remainder of the day there are no age restrictions. The lunch-room concession is leased.

The popularity of the pool and its financial success are shown by the attendance record since July 7, 1923, when the pool was opened, which shows that an average of 800 people per day used the pool during the rest of the 1923 season, with a record of 2,800 for a single day. The report on the pool for the season indicates that the revenue obtained, even from the nominal charges imposed, will not only pay the costs of operation and maintenance, but will soon return the entire cost of the plant. The returns from this pool agree with reports received from pools owned and operated strictly for profit, which show that the net annual returns from such pools amount to from 25 per cent to 80 per cent of the capital invested.

In view of the popularity and financial success of this pool, the Park Commissioners are now planning to build a complete system of self-supporting concrete swimming pools for the city of Altoona, so that hereafter the people of the city will not lack places for swimming in summer and skating in winter.

Pasadena's Municipal Plunges

THESE TWO PLUNGES IN BROOKSIDE PARK COST, RESPECTIVELY, ABOUT $28,500 AND $31,200. THE ATTENDANCE FOR MAY 19-SEPTEMBER 30, 1923, WAS 83,905

Interest Rates on Bank Balances

FORTY-NINE city auditors, thirty-four city clerks, eighteen city controllers and twenty-five other municipal officials have responded to THE AMERICAN CITY's request for information as to the interest rates which local banks are paying on city deposits. Twelve others, not included in the list, report that no interest is being received.

The accompanying table gives the rate of interest received on daily balances or, in some cases, on the lowest monthly balance. If a different interest rate is reported on long-term balances, that figure is given in the second column.

The following are excerpts from letters from some of the cities which have been receiving 4 per cent or more on their daily balances:

ASHTABULA, OHIO

Through competitive bids the city of Ashtabula secured a rate of 5.02 per cent on a daily balance of $100,000, and 4.17 per cent on smaller balances, for a period of three years. A shorter contract period would probably have meant a lower rate of interest, by reason of the possibility of a shift of funds to another bank.

The average balance for the last fifteen months has been about $317,000, the high mark being $457,000 and the lowest $191,000. The city has just completed an enlargement of the municipal electric plant costing approximately $750,000, has invested $250,000 in a municipal street railway since August 1, 1922, and is entering upon the second year's program of construction of a system of storm drains, sanitary sewers and sewage disposal plant, which, when the entire program is completed, will involve the expenditure of $700,000 to $800,000. These, together with street and other improvements, constitute a fairly large program for a city of this size (22,000 to 25,000).

Our charter provides that no contract involving the expenditure of money shall be entered into unless the city auditor shall first certify that the money required for such contract is in the treasury, to the credit of the fund from which it is to be drawn. Hence it will be seen that each improvement enterprise must be separately financed, and as the improvements mentioned overlap each other in point of time of construction, the daily balance on deposit is materially increased. As might be inferred, it is sometimes necessary, in the construction of these improvements, to withdraw from the depositary bank amounts large in comparison with the total deposit. It has been

Municipality	Interest Rate (per cent) Regular	Long-Term
Alcoa, Tenn.	3	4
Alice, Tex.	4½	..
Ann Arbor, Mich.	2½	..
Antigo, Wis.	2	..
Ashland, Wis.	2	..
Ashtabula, O.	4.17 to 5.02	
Austin, Tex.	2½	..
Barberton, O.	4¼	..
Batavia, N. Y.	4	..
Bay City, Mich.	3	4
Bloomer, Wis.	4*	..
Breckenridge, Minn.	2	5
Brookline, Mass.	2½	4
Buffalo, N. Y.	2½	4
Burkburnett, Tex.	5.2	..
Cadillac, Mich.	5.02	..
Canton, O.	3½	4¼
Charleston, Wash.	2	..
Chico, Calif.	2	3
Chilton, Wis.	3	..
Cincinnati, O.	4.57 to 4.63	
Cohoes, N. Y.	2	4*
Conneaut, O.	3	..
Connellsville, Pa.	3.125	..
Crookston, Minn.	3	5
Cudahy, Wis.	..	2
Dallas, Tex.	4.10	..
Dell Rapids, S. Dak.	..	5
De Pere, Wis.	2	..
Detroit, Minn.	2	4
Eau Claire, Wis.	2½	3
Erie, Pa.	3.75	..
Eureka, Mont.	2½	..
Fergus Falls, Minn.	2	5
Flandreau, S. Dak.	..	5
Flint, Mich.	2	4*
Fort Pierce, Fla.	2	4
Franklin, N. J.	..	4
Franklin, Pa.	4	..
Glasgow, Mont.	2½	..
Goldsboro, N. C.	3	..
Grand Forks, N. Dak.	2	4*
Grand Rapids, Mich.	3	3.95
Greensboro, N. C.	3	4
Hardin, Mont.	2	..
Highland Park, Mich.	2½	3
Highmore, S. Dak.	3	..
Hillsboro, N. Dak.	..	5
Horicon, Wis.	3	..
Huntington, W. Va.	3	..
Internat'l Falls, Minn.	2	4
Jackson, Mich.	3	4
Jackson, Minn.	..	5
Joplin, Mo.	3.03	..
Kenosha, Wis.	2	3*
Laconia, N. H.	..	3
LaCrosse, Wis.	2½	3
Lancaster, O.	2	..
Lebanon, Pa.	..	3
Lidgerwood, N. Dak.	3	5
Lima, O.	4.32	..
Lisbon, N. Dak.	2	4
Little Falls, Minn.	1	2
Lynn, Mass.	3	..
McKinney, Tex.	2.51	..
Malden, Mass.	2½	3½
Malvern, Pa.	..	3
Marks, Miss.	2	..
Menomonie, Wis.	3½	..
Miami, Fla.	2	4
Minneapolis, Minn.	2	3
Minot, N. Dak.	2	4†
Monett, Mo.	3½	4
Muskegon, Mich.	2¾	..
Muskogee, Okla.	3	3½
Napa, Calif.	2½	..
Nebraska City, Nebr.	2	..
New Britain, Conn.	2½	..
New Brunswick, N. J.	2	3
Newport News, Va.	..	4
New Rochelle, N. Y.	2	..
Oakes, N. Dak.	2	4
Olean, N. Y.	2	..
Onalaska, Wis.	2	..
Orange, N. J.	2	..
Orlando, Fla.	2	4
Park Falls, Wis.	..	5
Pasco, Wash.	2	..
Phillips, Wis.	2	..
Pierre, S. Dak.	3	4
Portland, Ore.	2	3†
Portsmouth, N. H.	4.6	..
Portsmouth, O.	2½	..
Pottsville, Pa.	3	4
Putnam, Conn.	..	4
Quanah, Tex.	2½	4
Rapid City, S. Dak.	4	..
Ravenna, O.	3	..
Reading, Pa.	2	3
Rice Lake, Wis.	4	..
Roanoke, Va.	2½	3
St. Bernard, O.	4.25	..
St. Marys, O.	2	..
St. Paul, Minn.	2	3
Salem, Ore.	2	..
San Antonio, Tex.	3	..
Sault Ste. Marie, Mich.	..	3
Sedalia, Mo.	2½	..
Sharon, Pa.	3	4
Spokane, Wash.	2	..
Springfield, Mo.	3½	..
Superior, Wis.	1½	3
Tacoma, Wash.	2	..
Tahlequah, Okla.	3	4
Temple, Tex.	3	..
Tewksbury, Mass.	2	..
The Dalles, Ore.	2	6*
Wahpeton, N. Dak.	2	..
Wakefield, Mich.	..	3
Waltham, Mass.	2½	4
Watsonville, Calif.	2	4
Wellsville, O.	2	2½*
Winchester, Va.	3	..
Winfield, Kans.	2	..
Yankton, S. Dak.	2	..
Zanesville, O.	2.55	..

*On certificates of deposit, or sinking funds, or loans. †Rate is for balances left for 6 months. Higher rate received if left for one year.

the policy of the city, however, to keep the bank informed as closely as possible as to the time and probable amount of such withdrawal. This reciprocity may have had something to do with the rate of interest offered.

M. A. TAYLOR,
City Auditor.

March 7, 1924

BARBERTON, OHIO

When the contract for our city funds was advertised two years ago, two bids were received, giving us 4.75 per cent interest on all city funds on daily balances. These balances showed a daily average of $311,450.98 for the year 1923. Last month we advertised the contract for the next two years, and received four bids, resulting in 3½ per cent on inactive funds and 3¼ per cent on active funds. We placed $150,000 each in two banks at 3½ per cent, and the rest of our funds will draw but 3¼ per cent for the next two years.

H. B. FRASE,
Auditor.

March 7, 1924

ST. BERNARD, OHIO

We comply with Section 4295* of the General Code of the state of Ohio, which calls for competitive bidding. Our good fortune in securing so high an interest rate is due, I believe, to the fact that we are close to the city of Cincinnati, and the one bank in the city of St. Bernard submits a high bid, both for reasons of civic pride and for the sake of its own financial statement.

FRANK J. SCHWAB,
Auditor.

March 10, 1924

* Under the terms of this act, any political subdivision of the state of Ohio may provide by ordinance for the deposit of all public moneys coming into the hands of the treasurer in such bank or banks, situated within the municipality or county, as offer, at competitive bidding, the highest rate of interest; the safety of such deposits to be protected by the bank by sufficient bond or surety or by a deposit of interest-bearing obligations of the United States or other public securities, under conditions specified in the act.

FRANKLIN, PA.

The city of Franklin has been, for several years, receiving 4 per cent interest, each month, on daily bank balances in city and water department funds. In the last two years these receipts from interest have totaled $4,080.

Prior to 1910 the city has received no interest except on sinking fund moneys placed in savings accounts, on which interest was credited each six months at 4 per cent.

In 1910, as a result of taking bids, the city received 3½ per cent on all funds, interest being paid each month. Later this was increased to 3⅜ per cent, and again in 1918, as the result of competitive bids, 4 per cent was paid. This rate has prevailed since that date.

All special funds are placed in open rather than savings accounts, in order that the interest may be compounded every month instead of every six months as is the rule in savings accounts.

J. G. CRAWFORD,
City Clerk.

March 10, 1924

BURKBURNETT, TEXAS

We secure unconditional competitive bids from local banks each year. Our daily balances for the past two years have averaged approximately $90,000, a portion of which was improvement money which could be used any time the City Board of Commissioners might desire.

Last year we received 5.6 per cent on daily balances, and this year we are receiving 5.2 per cent. The city pays the premium on the bond required of the bank.

Our banks can afford to pay this rate, because they make good loans at 8 per cent. The banks have almost always been in hearty accord with the city's financial program, which sometimes has a bearing on the rate of interest offered municipalities by banks.

J. J. ENGELMANN,
City Comptroller.

March 10, 1924

To Confer on Traffic Problems

THE mayors of 411 cities and towns in New Jersey, New York and Connecticut within a radius of fifty miles of New York City and the presidents of 950 civic organizations have been invited to participate in a conference on the traffic problems of this area, to be held at the Town Hall in New York City, beginning at 10:30 a.m. on May 20. The conference will be held under the joint auspices of the following organizations:

Automobile Merchants Association
Bridgeport Chamber of Commerce
Bronx Board of Trade
Brooklyn Chamber of Commerce
Chamber of Commerce of the State of New York
Merchants Association of New York City
New Jersey State Chamber of Commerce
New Jersey State League of Municipalities
New York State Association
North Jersey Rapid Transit Commission
Queensboro Chamber of Commerce
Staten Island Chamber of Commerce
and the
Committee on the Regional Plan of New York and Its Environs

The call for the conference points out that every city in the region of New York is facing the difficult task of handling not only its own constantly increasing local traffic, but also that which flows daily to and from the larger cities in the region, particularly that which originates in, or is bound toward, New York City. The conference will consider not only the congestion of traffic, but the traffic accident situation, traffic costs, convenience of travel within the region of New York (or lack of it), the adequacy of existing bridges, tunnels, streets, and highways, the probable future need for wider, more numerous and differently located traffic arteries, and the whole relation of traffic problems to the contemplated Regional Plan of New York and Its Environs.

The mayor of every city in the region of New York has been asked not only to attend the conference personally, but to send city engineers and other officials whose duties relate to traffic. Similarly, the presidents of civic organizations are asked to attend personally and to request the chairmen of their traffic, transportation, accident prevention and city planning committees to be present also.

An Unsightly Spot Made Beautiful as a Result of City Planning

THE PREVIOUS UNSIGHTLY APPEARANCE OF THE RIVER AND BANK

THE TRANSFORMED BANK OF THE PICTURESQUE BRONX RIVER

These "before" and "after" views of the Bronx River Parkway, New York, are used effectively as a frontispiece to the recently published Preliminary Report of the City Plan Commission of Elizabeth, N. J.

His Community Honors Luther Burbank

FOR the last three years, the city of Santa Rosa has been at work upon a scheme for the development of a park in honor of its remarkable citizen, Luther Burbank, who has contributed so much toward the evolution of horticulture. This park was acquired by the citizens of Santa Rosa through a Park Commission especially appointed for this purpose, and with the cooperation of the city and the Chamber of Commerce.

The park contains approximately 39 acres of land, located at the city boundary, and is contiguous to the site on which is to be built a very beautiful modern high school. The park was planned with a view to symbolizing the work of Mr. Burbank, and will contain the following features of especial interest:

1. A section of a little less than an acre devoted to the raising of plants developed by Mr. Burbank, the planting of which will be under his personal direction and supervision.

2. A central building with auditorium, library, and laboratory, the auditorium to be connected with an outdoor stadium having a seating capacity of about 5,000. The stage is so arranged that it can be used for spectacles with an indoor and an outdoor audience watching at the same time.

A SECTION OF THIS PARK IS DEVOTED TO THE MODERN EVOLUTION OF HORTICULTURE

THE HUMAN HAND RAISING THE LEVEL OF THE EARTH

Design for a statue symbolic of Mr. Burbank's work

3. An outdoor theater, with a seating capacity of only about 300, to be devoted to outdoor meetings, lectures, and performances of various kinds.

4. A playground which can be used by the pupils of the high school or by those using the park.

The planting will be done in such a way as to be representative of the flora of central California. A rose garden for the great variety of roses that can be grown in California will be included.

The approach to the central building will be from the main highway. And between the building and the highway it is planned to place a statue symbolic of the work of Mr. Burbank. The statue was modeled by Roger Nobel Burnham, and symbolizes the human hand raising the level of the earth. The park design was carried out under the supervision of Dr. Carol Aronovici, city planning consultant, and lecturer in the Extension Division of the University of California, now residing in Berkeley.

Springfield's New Street and Transportation Plan

By Francis P. Ide

Secretary, Zoning and Plan Commission, Springfield, Ill.

THE comprehensive city plan recently prepared for Springfield, Ill., by Myron H. West and staff of the American Park Builders, of Chicago, provides for the future growth of this city to a population of 200,000, the present population being in the neighborhood of 58,000.

Based upon a comprehensive zone plan, the main thoroughfare plan was prepared, which in turn formed the foundation for a complete system of streets arranged with rectangular blocks on level lands and with curved streets along streams and ravines where high-class residence property is expected to develop.

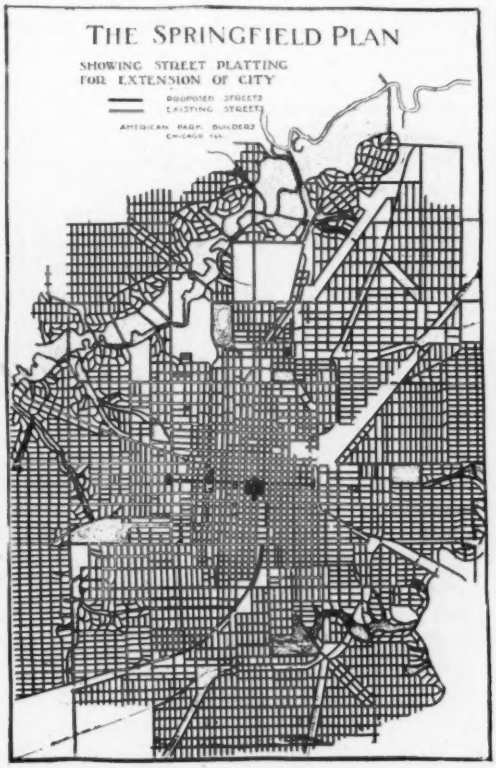
The new platted areas for future growth embrace a total of about 10,500 acres, of which 2,100 acres are in the factory district. The present platted area of the city amounts to about 5,700 acres. After the new street plan had been prepared, with full consideration given to traffic flow, accessibility to main objective points, and proper land utilization, the city planner submitted the following estimate of the saving to the city which could be expected by use of the new platting:

"The new platting uses for streets 27.94 per cent of the residential area and 20.74 per cent of the factory area, as against 36 per cent everywhere required for the old platting. This permits a saving of nearly a thousand acres, which, at 20 cents per square foot, would figure a land value of about $8,700,000. Moreover, the new platting saves about 85 miles of streets, which figures a saving of about $14,300,000 for street improvements; or a saving of about $23,000,000 for both land and improvements. Based upon the expected population of 200,000, this would indicate a saving of $5.75 in taxes per capita fifty years hence."

The street plan calls also for widening, opening and other corrections in connection with several existing streets, in order to make the city as a whole more convenient of use.

The railroad plan calls for the consolidation of three parallel lines which now extend through the city at short distances apart. The estimated total cost of this consolidation is approximately $1,500,000, exclusive of the new passenger station and freight yards. Ninety-two grade crossings would be eliminated and twenty-two miles of main track would be removed from the area affected. An annual saving in operating charges to railroads is estimated at $260,000, which, capitalized at 5 per cent, would amount to nearly three and a half times the estimated cost of the entire improvement.

Street-car lines have been planned to extend into the future territory in such a way as to provide a complete system of through routes and feeders, bringing the car lines within 1,500 feet of every home and enabling transportation from any part of the city to the main objective points—the union passenger station, factory district and business sections—either by the use of a through-route car or with not



LIGHT LINES SHOW EXISTING STREETS; DARK LINES PROPOSED STREETS

more than one transfer. Several changes in the present street-car lines have already been made, in conformity with the recommendations, and the general plan is based upon the economical extension of lines to give adequate service on a five-cent fare and adequate returns on the investment. The plan provides for both comprehensive and immediate zoning, a fully balanced park and boulevard system, school sites, a capitol group, and for a Lincoln memorial group at the old Lincoln homestead.

If Job Had Been a Traffic Officer

By Frank H. Warren

Claim Agent, Chicago, South Bend & Northern Indiana Railway

EDITORIAL NOTE.—*The following is Number 7 of a series of articles by Mr. Warren which have been published by "The South Bend Tribune" in a daily department headed "Playing Safe in the Highways."*

A BUSY traffic officer resembles nothing so much as a small boy in a nest of hornets. He has about the same chance to get stung. The main difference is that the stinger in his case weighs anywhere from one to 35 tons and is capable of putting him in the cemetery or the hospital with one sting. If I were a traffic officer, I'd want to be a hundred feet underground and guide traffic with a periscope. I suppose these men were originally safety devices. If so, that object has long ago become of secondary interest. It is their main job now to move the traffic. They are a piece of the highway operating mechanism.

Stand on the corner during a busy hour and watch him work. It will make you dizzy just to look on. Two long strings of swiftly moving vehicles, four street cars turning four different corners, four streams of pedestrians who pay exactly the same attention to him that the moon does to my crop of beets, two impatient lines of standing vehicles with horns screeching in every tone from high C flat to low G sharp, nine autos making left-hand turns and surrounding him like the hungry pack around a newly elected president, while a young man demands instant information about how to go to 407½ East Condit Street, how far it is and does he know John Chicozywolinski. A traffic officer has about as much chance to breathe as a chicken under water; and like a whale he has to come up every hour for air.

If Job had been a traffic officer, he would have thought no more of his boils than an elephant does of the hives. When it comes to patience, a good traffic officer is so far ahead of him that Job and his boils couldn't even see his tail-light. Yet if he fails to tip his hat to every bobbed head that passes or violates any of "Jones' Correct Rules of Parlor Etiquette" in six volumes he's a roughneck and ought to be kicked off the force. I've heard he sometimes swears, which is a wicked thing to do in the innocent ears of model auto drivers, but the surprising thing would be his failure to cuss.

There are a lot of ways in which we can add to the pleasures of his job. If he raises his voice above the well-modulated tone of polite society when you run against his "Stop" signal, tell your friends what a discourteous police force we have. If he doesn't give you a quick "Go" signal when he knows you are a friend of a street sweeper's assistant's cousin, complain to the mayor. If he won't let you make a left-hand turn, remind him that you have driven in Chicago and this is hick town stuff. If he asks you to get out of the way of the fire department, stand and argue with him and tell him you're the chief of the fire department yourself. Never give him an encouraging word or a pleasant nod or do a single thing to make his hard task less difficult.

And you, capable officer on a hard job, remember that not one out of every hundred offenders is a willful offender and that so long as you are efficient, even-tempered and decently courteous in the face of trying conditions, the good people of this city are ready to forgive and forget your honest mistakes and are with you. And the good people of this and every other city are always a good, comfortable majority of the whole.

The Economic Utilization of Land in City Building

By Robert Whitten

Cleveland, Ohio

IN all ages most mistakes in city building have come from too niggardly a use of land. The crowding of houses on the land, the crowding of many families into a single building, the narrow ways left for access to the buildings and for general traffic, and the omission of open spaces for play, recreation and the exigencies of the future, have made increasing congestion with its attendant serious evils a necessary incident to city growth.

At the time a city is founded there is nothing so cheap as the raw land. There is no reason why at that time adequate traffic ways and open spaces cannot be provided to take care of all possible future requirements. Such provision usually can be made without any sacrifice of convenience or comfort but with a great increase of pleasure and beauty in the lives both of the earlier inhabitants and of those who come after them. The only bar to its realization has been a lack of appreciation of the obligation we owe to those who are to come after us and for whom we hold the land in trust—and a lack of sufficient foresight to envisage the requirements of the distant future.

Human knowledge, either of the practical or of the organized and scientific variety, is as yet inadequate in itself for good city planning. It needs something more; it needs faith, foresight, imagination and at least a touch of inspiration; it needs an intuitive conception or breadth of vision that is not born solely of reason.

In many cases the natural comfort and beauty of the original town are unnecessarily sacrificed to the supposed requirements of city growth. The open spaces about buildings provided in the development of the original town, in the interest of comfort, convenience and beauty, are later filled solidly with buildings. The detached dwellings setting back from the street are replaced by solid rows of apartments and tenements, coming out to the sidewalk line and crowding out the trees and the play space of the children. The three-story business buildings are replaced by skyscrapers that are entirely out of proportion to the width of the narrow street and its capacity to provide light, access and appropriate setting for the tall buildings along it. Because of the alleged scarcity of land convenient to the city, people are crowded into tenements with only narrow courts for light and breathing space; while as a matter of fact the only thing that prevents the spreading out of the population in detached dwellings is the congestion in the narrow traffic routes that slows down all transit and automobile traffic to and from the suburbs. If, as the city grows, a part of the lawn space in front of the detached residences were used for street widening, the population could be taken care of, for the most part in detached dwellings, and without resort to the congested tenement.

It seems to be almost a law of city growth that with the advance of civilization an increasing proportion of the land area is required for the various urban uses and services. The streets of ancient Rome would seem like alleys in a modern city. It may be that the streets of to-day will seem like alleys in the city of the future with its increased and modified traffic requirements. All improvements in trans-

A Fundamental Obligation

God has lent us the earth for our life; it is a great entail. It belongs as much to those who are to come after us, and whose names are already written in the book of creation, as to us; and we have no right, by anything that we do or neglect, to involve them in unnecessary penalties or deprive them of benefits which it was in our power to bequeath.—Ruskin.

portation and communication increase the volume of traffic and the space required to accommodate the transportation and communication services. The highways have had to be supplemented by canals, railroads, power transmission lines and oil pipe lines. In the modern city the street subsurface with its network of sewers, water, gas and steam mains, wire conduits, pneumatic tubes and rapid transit subways, is even more congested than the street surface. What demands for parking and landing space the air traffic of the future will make can only be vaguely surmised. One thing is certain, that the more open the present urban development, the easier the adjustment to future requirements; and though we cannot now foresee the exact nature of those requirements, we may be sure they will involve an increased need for open or unbuilt-upon areas.

With the automobile and the motor bus a much larger proportion of the population of our larger cities would now be enjoying the comfort of suburban homes, were it not for the failure of the street capacity to keep pace with the increased burden placed upon it. A really adequate street system and convenient areas for automobile parking and storage would quickly revolutionize housing and living conditions in our cities. With the present development of the art of transportation, the bulk of the population should live in single-family detached houses, and a very considerable portion of these should enjoy the advantage of semi-rural surroundings. The art of city building lags far behind the art of transportation.

We may be sure that future improvements in transport facilities and the increased movement of goods and people occasioned thereby, will make necessary the provision of wider traffic ways and much more adequate storage and terminal facilities. Unless we provide in present planning for a much more open development in and about our cities, future needs can only be met at an almost prohibitive cost.

Our Only Hope of Substantial Relief

The suburban or satellite town offers our only hope of substantial relief from the increasing congestion incident to the ever-growing bulk of the great city. A suburban town near a great city offers the opportunity for almost ideal living and working conditions. But, judging from the past, the suburban town of to-day will to-morrow become an integral part of the great city. Its individuality and its suburban characteristics will be lost in the engulfing sweep of the great city proper.

A great city like the London or New York of to-day is made up of many one-time suburban communities that have gradually grown together. Their former boundaries would now be difficult to trace. Their physical and in most cases their political identity have been lost. In some cases this is proper and inevitable. In general, however, the sweeping of the great city over the smaller and the obliteration of its physical or political identity or both have had unfortunate results both economically and socially.

It should be possible so to plan the industrial suburb that its industries will not be driven out by high taxes, by lack of room for expansion, or by the crowding out of its supply of efficient labor through high rents and congestion. A first essential is a permanent physical barrier to the engulfing sweep of the great central city, If no natural barrier such as a broad river exists, an artificial barrier should be created.

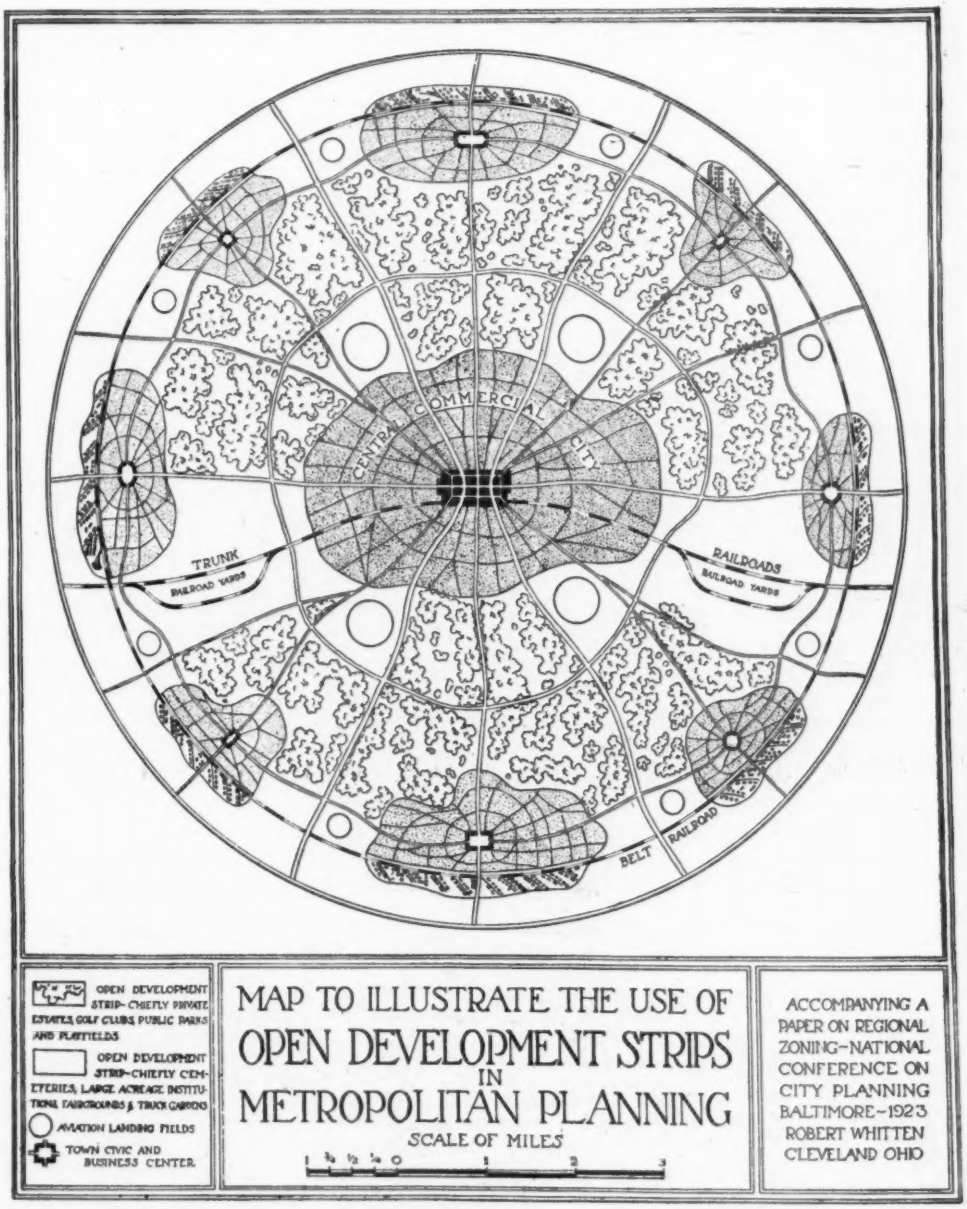
Ideally, the central commercial city should be surrounded by suburban or satellite cities. The central commercial city should have an area of 50 to 100 square miles, and this area should be surrounded by a strip of park, farm or other open development use about one mile in width. Each satellite city, whether industrial or residential, should be laid out with an area varying from 4 to 25 square miles and for a maximum population varying from 5,000 to 250,000. An open development strip from one-half mile to one mile in width should separate each satellite from its neighbors.

It may be thought that, by placing an absolute limit on the outward expansion of the central commercial city and of its tributary, industrial and residential satellites, all progress and development will be stopped when these limits are reached. As a matter of fact, sound development will be promoted rather than retarded or stopped. As the older satellite cities are filled up, new ones will be created. The great difference will be that the new devel-

opment will not destroy or render obsolete the old development. Each part of the metropolitan region will benefit by the growth of other parts, and all this growth, wherever located, will increase the business and prosperity of the central commercial city.

How an Encircling Strip Can Be Used

The encircling open development strip need not remain idle or restricted to merely agricultural uses. Almost any use that requires large acreage and a small percentage of cover and that does not draw large crowds of people to it daily can be properly included. Among the uses other than agricultural that seem appropriate are: large parks, parkways, playfields, forest reservations, golf and country clubs, private estates, cemeteries, water-supply reservoirs and filter beds, air terminals, city, county and state farms and institutional buildings.


CENTRAL COMMERCIAL DIST.
TRUNK
RAILROAD YARDS
RAILROADS
RAILROAD YARDS
BELT
RAILROAD
OPEN DEVELOPMENT STRIP- CHIEFLY PRIVATE ESTATES, GOLF CLUBS, PUBLIC PARKS AND PLAYFIELDS
OPEN DEVELOPMENT STRIP-CHIEFLY CEMETERIES, LARGE ACREAGE INSTITUTIONS, FAIRGROUNDS & TRUCK GARDENS
AVIATION LANDING FIELDS
TOWN CIVIC AND BUSINESS CENTER
MAP TO ILLUSTRATE THE USE OF
OPEN DEVELOPMENT STRIPS
IN
METROPOLITAN PLANNING
SCALE OF MILES
1 ½ ¼ 0 1 2 3
ACCOMPANYING A PAPER ON REGIONAL ZONING-NATIONAL CONFERENCE ON CITY PLANNING BALTIMORE-1923
ROBERT WHITTEN
CLEVELAND OHIO

private institutions occupying large acreage, fair grounds, sewage treatment works, truck gardens, greenhouses and railroad car storage and classification yards.

In addition to the specific uses of the open development strips indicated above and the maintenance of the integrity of the satellite cities, the preservation of these wide semi-open strips will prove useful in many ways. They will block the spread of conflagrations. They will furnish economical routes for future railroads and railroad belt lines, electric power transmission lines, oil pipe lines, water-supply tunnels, interurban railway and bus lines, high-speed trucking and automobile roads, and airplane courses. As routes for airplanes with frequent landing and parking spaces, they will aid in the practical application of this great invention to city life and work. When the airplane is at length "Fordized" and each man has his "flitter," these open development strips may have a new and rather intensive sort of usefulness.

"The Fitting of Form to Function"

True art gives the short cut to the best solution of many problems. The artist knows that each building should have its setting, each dwelling a lawn and garden about it, and that similarly the closely built-up portions of each town should be surrounded by a green belt of open country. The artist, too, designs the great university as a unit but with a campus and with open grounds and with a setting and individuality for every building. So, too, the great city should have its central city and its suburban towns, all with spacious grounds about them, giving them dignity, individuality, breathing space and permanence.

Art is but "the fitting of form to function"; and the truly useful and the truly beautiful are one and the same. We may be sure that there is something lacking in the economy and utility of our design if it does not show the line of beauty. A design that appeals strongly to our sense of beauty is apt to have in it greater real economy and fitness to function than one that has resulted from a hard-headed adherence to obvious, immediate needs. The perception by a community of real beauty in a design of city building is the result of intuitive insight and is more to be trusted as a guide to community development than the more obvious design related strictly to immediate needs. Park systems have been developed by American cities more through trusting this instinct for beauty than from any reasoned appreciation of the recreational and spiritual value of the park in the life and growth of the community.

It is our instinctive love of order and beauty that often guides us to the truly useful. With harmony and beauty as a guide, we build more wisely than we know. But we must let this instinct guide us, and not attempt to control and guide the instinct; for if we do, we may get only the dead husks of what once was beauty. A community sometimes imitates the styles and forms of ancient Athens or Rome in its too conscious quest for civic beauty, instead of permitting beauty to come as naturally as does the glow of health to a sound and vigorous constitution. The city beautiful is the spontaneous product of the city vigorous, healthful and efficient, and the city efficient is a no less necessary concomitant of the city orderly, harmonious and beautiful.

Woman's Club Has Symposium on City's Needs

THE Good Citizenship Bureau of the *Woman's Home Companion*, conducted by Anna Steese Richardson, reports that recently the Atlanta Woman's Club held a community meeting which drew throngs to its handsome building. "The attraction was a symposium on 'Citizenship,' or 'What Does Atlanta Need?' All civic and patriotic organizations, the City Government, and the County Commissioners were represented. Thirty speeches of five minutes' duration each were made and a decision rendered by three judges as to the three greatest needs of Atlanta. The first was Education, meaning better public schools; the second Parks and Playgrounds, and the third City Planning, looking fifty years into the future instead of five. Every need of the city, or indeed of any city the size of Atlanta, was brought out, and at the close of the meeting one thousand crêpe myrtle trees (indigenous to this part of the South) were presented to the club, to be planted wherever, in the wisdom of the Planning Committee, they will most beautify Atlanta. This program might help club workers in other communities. For particulars of this extraordinarily successful evening write Mrs. Alonzo Richardson, 946 Peachtree Street, Atlanta, Ga."

Financing Water-Main Extensions

By H. F. Blomquist

Superintendent of Water-Works, Cedar Rapids, Iowa

THE pipe system of a municipal water-works may be divided into two main classes—the distributors and the feeder mains. The distributors are the gridiron arrangement of small mains, usually 6- or 8-inch pipes serving the individual fire-hydrants and blocks of consumers located along the various lines. The feeder mains are the large pipe lines which conduct water from its source to the various sections of the city to supply the distributors.

The distributors are of value only to the abutting property owners whom they serve with water and to whom they furnish fire protection. In general, an extension of distributors does not add to the usefulness of the water system except as a means of serving the particular owners who may make connections with it. In other words, they are set apart for the use of a certain group of individuals, and cannot be used by any other group. In this respect they are different from all other parts of a water system. The source of supply, pumping machinery, purification plant, etc., serve all consumers in common, as the needs may be, and improvements or additions to them are equally valuable to all people served by the water system, but this is not so with improvements or additions to the distributors.

The pipe system of a water-works represents from one-half to three-fourths of the total investment in the plant, and the small pipes, or distributors, represent the greater portion of the ordinary pipe system. An increase of 100 per cent in the cost of water-main construction in a short time, together with an increasing demand for water-main extensions in rapidly growing cities, has made the financing of extensions a major problem, especially in Iowa, where there is as yet no authority for financing them by frontage tax or a special local assessment against the benefited property.

Who Pays and How?

The function of a public water-works is to furnish various services to the inhabitants of the community in which it operates. The total cost of furnishing these services must be paid by those who receive them. This applies to municipally owned plants as well as to those owned by individuals. In order to make equitable charges for the different classes of service furnished, such as water for domestic use, industrial use, fire protection and other public uses, the costs are analyzed into their various elements, and one of the large elements is an overhead, or fixed expense, due to the large investment in the distributing system, or pipe lines, for bringing the water from the source of supply to the consumer, who may be many miles away.

There are some fundamental differences in the methods that may be used in dealings involving financial matters by municipally owned and privately owned utilities. This paper deals with the problem of financing water-main extensions by municipally owned plants.

Financing by Assessment

Because of the large investment necessary in distributors, and recognizing the fact that they serve only a certain group of individuals, most of the states have passed statutes, which are upheld by the courts, that permit municipally owned water-works to charge all or a portion of the cost of such extensions to that group. A common practice in those states is to make extensions upon petition of the owners of a majority of the abutting property, and make an annual assessment, usually of 5 to 10 cents per front foot of abutting property, for a period of ten years. Another method used is to make direct special assessment of from two-thirds to the total cost of the extension and certify for collection in yearly installments according to the governing laws. The details of the plans are left for each municipality to work out according to its own preferences.

Advantages of Frontage Tax System

There are several advantages of the special assessment or frontage tax system for financing main extensions, among which are the following: Extensions can be made into new and sparsely settled territory without loss to the water department, and people who would otherwise not be able to get the benefit of public water service may have it at a nominal

expense, usually much less than any other water-supply would cost them. Parties interested in opening new additions can have extensions made without being obliged to guarantee incomes, or to pay interest on the investment in a direct way, or to put in water-mains at their own cost.

Other Methods and Relative Advantages

Where special assessments or frontage tax is not permitted, water departments have resorted to various other methods of dealing with main extensions. Some cities make extensions under contracts with owners of property, by which the owners guarantee an annual income of a certain percentage of the cost of construction. Others require the landowners to make the extension at their own cost, and when a sufficient number of connections have been made so that the revenue equals a certain percentage of the cost, the water departments will take the extension over at construction cost, or valuations to be made according to contract stipulations. These systems have worked fairly well where ownership of property is vested in one or two parties, but where lots have been sold to individuals, this arrangement becomes difficult and cumbersome and can rarely be used.

Whether a system of assessment of costs in main extensions is followed by which a portion of the income for water service is derived, or whether some other method is used, the fundamental principle remains that the consumer must eventually pay all costs of the service. There are, however, some decided advantages in one system over another, due to differences in business procedures necessary to provide the required funds. Where no form of assessment or tax for mains is used, all the costs of extensions must come in the form of water service charges, and since the outlay in mains is necessary long before income from them is available, the department must resort to the issuing of bonds or other form of indebtedness for carrying the investment until the returns from it will be sufficient to liquidate them. Frequent issues of bonds are undesirable, and often hard to bring about where popular vote is required, and are more costly than the more direct way of partially paying as you go. On the other hand, when charges are made in one form or another as soon as mains are laid and services available the financing of extensions becomes greatly simplified.

It must be considered, however, that if a part of the income is derived from assessment or taxes, the rate for water sold should be correspondingly lower. It is simply a method of dividing the cost of service into two parts, one of which is payable as soon as water service is available, and may be considered as a ready-to-serve charge; and the other part payable when water is actually used. Courts have sustained ready-to-serve charges in public utilities other than water service, but the principle involved is the same whether it is water, gas or electricity.

Some just objections to making a change from a non-assessment system to the other might be raised on the ground that owners of property along which future mains are to be laid will be required to pay more for water service in the form of assessments or frontage taxes than owners where mains were laid before, who got them without any extra expense. These differences would not be great, however, and are offset to some extent by the older consumers' having paid a greater portion, in some instances at least, toward the purchase or building up of the water plant.

In order to simplify the financing of water extensions, and yet overcome objections to an abrupt change from a method of no assessment or charges, to one which involves special assessments or taxes, a proposed law was introduced in the Iowa Legislature at the last session, but failed to pass, which provided for assessments against the benefited property in an amount equivalent to the cost of a 6-inch main, but with this difference from the ordinary methods, that after a property owner made connection to the mains, and became a regular consumer, the amount of assessment paid would be refunded to him. This method would simply throw the burden of carrying the investment of water-mains in unproductive territory upon the property owner until he would require water service. This principle can be defended on the ground that after water is available the property would be increased in value to fully offset the expense of carrying the investment. In reality, it would be only a ready-to-serve charge for the assurance of being able to have water service, which would be of actual value to the property owner.

Based upon experiences with the problem of financing extensions under both methods, it is the writer's opinion that the ready-to-serve charge or assessment plan for municipal water-works meets the requirements much better because it distributes the cost of service more equitably and makes it possible to meet the needs of water-service extensions much more readily.

ACKNOWLEDGMENT.—From a paper read before the Iowa Section, American Water Works Association.

Do Your Meter Readers Read Meters?

Maywood, Ill., Increased Revenue 30 Per Cent by Careful Checking Up

ACCORDING to Lawrence W. Cox, Village Manager, Maywood, Ill., in a recent issue of the *City Manager Magazine*, the fact that a city has meters does not necessarily mean that they are being used effectively. In June, 1923, it was discovered that, except for the large meters, only about 10 per cent of the water-meters in Maywood, a city of 18,000 population, had been correctly read during the last three years. One man had read substantially all meters for years and, having carried the previous readings with him on his cards, found it comparatively easy to make estimated readings look consistent.

What this failure to have correct readings meant to the water department can only be estimated. The amount of unrecorded water which had passed through the meters ranged through all amounts up to $100 per meter. For 3,500 meters the loss is estimated at about $40,000. The quarter following the correct reading of the meters there was an increase of revenue of about $900, which can be credited solely to correct meter reading. Of course, this gain will not continue very long, because customers are learning to waste less water, and, this waste once checked, the bills will be smaller, but the dollars-and-cents gain in actual revenue will continue to be considerable, and the waste thus eliminated will result in a saving in pumping and maintenance costs.

Another gain is the saving of water which is already being effected. This means a more adequate supply of water available, which is very much needed, without additional investment in wells and plants. That there had been a large amount of waste is seen from the fact that for the first set of accurate quarterly readings in each of the three meter sections, a number of water bills amounted to $10 and $15, a few $45, and one $100. In most of these cases a normal consumption would not have exceeded $4, and in no case would it have exceeded $10.

Regardless of public comment and warnings, there are a large number of consumers who continue the use of defective fixtures which constitute the principal cause of these large bills, and they will continue until the large bills come directly home to them. However, the excessive waste is being checked. The first set of second-quarter bills of correct readings show a noticeable absence of the extremely large charges. The very large bills, of course, created resentment among many of those affected. Everything is being done, however, to offset or neutralize this feeling. Before the office presents the large bills, the meter reading is checked, the previous quarterly reading is examined to see that it appears consistent, and then the premises are examined for defective fixtures or other causes of heavy usage. In the more extreme cases a test of the meter is made in place. Endeavor is made to have the consumer witness the test of the meter and to explain to him that the examination and test are being made because of the large water bill and that the water department is doing everything in its power to help him locate the trouble so that he may not be overburdened with another large bill.

Washington, D. C., Adopts New Load Limit for Motor Trucks

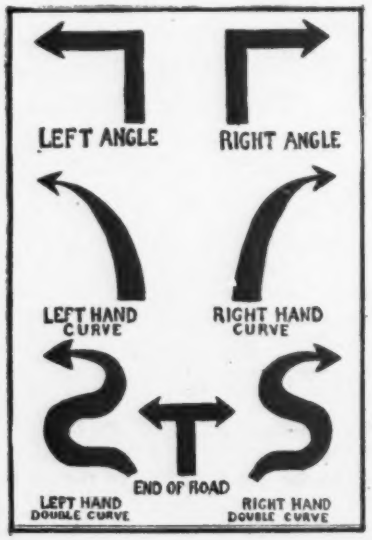
FOLLOWING hearings that have been in progress for several months, the Commissioners of the District of Columbia have decided to establish a limit of 28,000 pounds for loaded motor trucks. This decision is in line with recommendations submitted by the Bureau of Public Roads made by its Chief, Thomas H. MacDonald. It is also in accordance with the standard policy of the Motor Vehicle Conference Committee.

"Probably $25,000 annually is saved by the Federal Government in the transportation of fuel in 7½-ton trucks as against 5-ton units in the city of Washington," testified G. F. Pope, Engineer in charge of the Government Fuel Yards, Department of the Interior, before the Commissioners at one of the recent weight limitation hearings. That weights of vehicles traveling over the highways should be those which provide the most economical transportation, and the fact that with the same weight distribution the difference between a 25,000-pound limit and a 28,000-pound limit is so slight that it has no appreciable effect on the highway or street, was brought out by representatives of the Bureau of Public Roads. Emphasis was laid upon the need for enforcement of present regulations to prevent overloading. This the Commissioners declared impossible and asked for an agreement among the truckers as to what would be a proper penalty for violation of overloading regulations.

Uniform Danger and Caution Symbols for Canadian Highways

By George A. McNamee
Secretary, Canadian Good Roads Association

A DISTINCT step forward in ensuring the safety of the highways has been achieved as a result of the Interprovincial Conference of Highway Officials held in conjunction with the Canadian Good Roads Association. At their last meeting, held in Winnipeg, a series of resolutions dealing with the uniformity of caution and danger signs on public roads were unanimously passed, and were submitted by the delegates to their respective governments. Word has now been received that practically every province in the Dominion has endorsed these decisions and will take the necessary steps to put them into effect. All the eastern and most of the western provinces have adopted the uniform symbols, and at the coming convention of the Canadian Goods Roads Association at St. Andrews by the Sea, on June 24, 25, 26 and 27 next, a further conference of provincial highway officials and engineers will be held to discuss other matters of uniformity regarding the use of the highways and the administration of departments on uniform lines with a view to securing greater efficiency and economy.



The resolutions arrived at by the conference included the adoption of the uniform caution and danger symbols here shown.

The symbols will be not less than 3 inches in width, tapering off with an arrow, painted black on a white background on boards 2 feet square, erected on posts on the right-hand side of the highway so that the bottom of the sign shall be not less than 5 feet or more than 6½ feet from the level of the traveled portion of the highway adjacent to the sign. They will face approaching traffic at right angles with the highway, as close to the edge of the traveled portion of the road as possible, and are to be located at a distance of 300 feet from the point of danger. In cases where the local surroundings will not permit of the erection at this distance, the selected location shall be not less than 300 feet. A special sign bearing the words "Narrow Bridge," placed at a distance of 300 feet, will warn vehicles approaching a highway bridge of a width narrower than the roadway.

White Lines on Pavements

The conference also favored the painting on the center of hard-surface roadways of a white line 4 inches in width the full length of the curve, to assist traffic to keep to the right of the center, especially at night, and thus aid in the prevention of accidents. A further resolution was that only such signs for the direction and safety of the public as may be approved by the Provincial Government may be used within the boundary of any rural highway or road, and that as regards streets and roads which, although situate in cities and towns, form a continuation of the rural highway or a connection between rural highways, the co-operation of such cities or towns be obtained with a view to uniformity in the sign-boarding of such streets and roads. The putting into force of these regulations will be a real boom to all travelers and will do much to ensure safety on the highways and remove many conflicting and useless signs that now clutter them.

EDITORIAL NOTE.—For a study of Traffic Control and Facilitation especially in relation to cities, readers are referred to Section 14 of The Municipal Index for 1924. The importance of safeguarding grade crossings, pending their total elimination, was emphasized in the 1922 report of the Committee on Traffic and Transportation of the American Society for Municipal Improvements with the following recommendations: "The width of all roadways crossing railroads should be at least 20 feet. For a distance of 100 feet on each side of the railroad the grade of the highway should be level or not over 2 feet rise or fall in 100 feet."

The Extent of Centralized Purchasing in American Cities

A Survey of the Number of Cities Practicing Centralized Purchasing in Each State and Province

By Russell Forbes

Research Secretary, National Association of Purchasing Agents, New York City

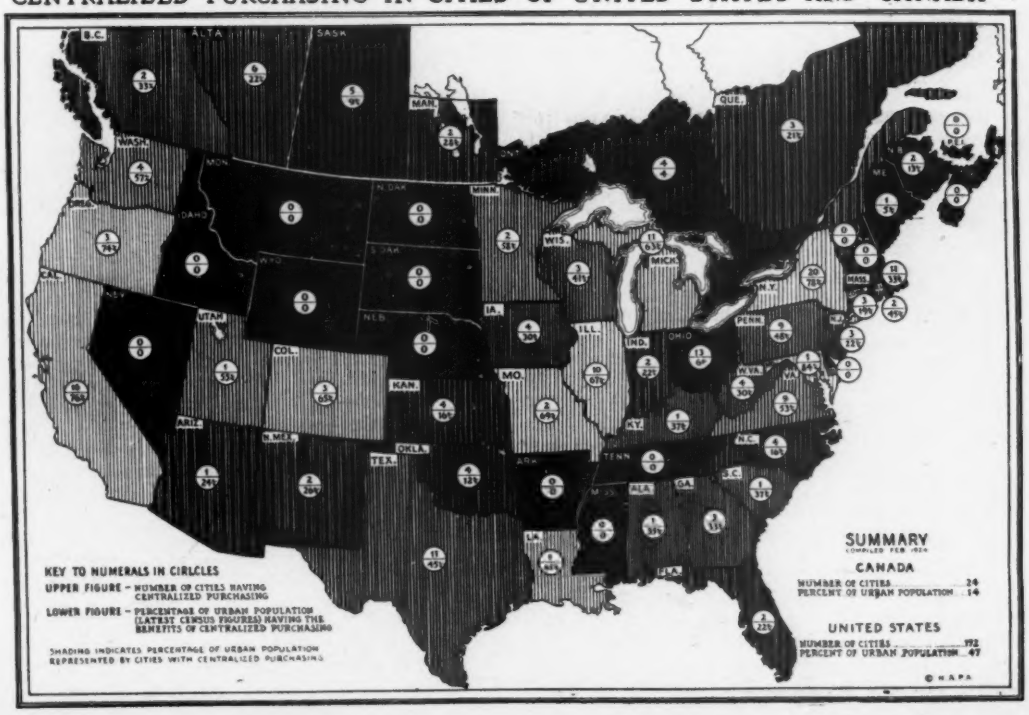
AN exhaustive survey has been under way for over a year to determine the present extent of centralized purchasing in American cities. The latest figures show that 196 cities with population over 10,000 in the United States and Canada have provided the necessary legal authority to establish a central supply procurement system. Of this number, 172 are cities of the United States and 24 of the Dominion of Canada. Cities of less than 10,000 population have not been counted, for it is thought that little, if anything, can be saved by centralized buying for smaller municipalities. Many towns of less than 10,000, however, now follow this plan. Some additional cities with a central buying agency may not yet have been located by this survey. But at least 196 may be so classified.

The present extent of the plan is all the more noteworthy in that it is almost entirely a product of the present century. The first municipal purchasing agency to survive the experimental stage was established in 1896.

In several cities centralized purchasing exists in name only. The necessary charter or ordinance provisions have been enacted, but the law has been disregarded on account of "politics," an unsympathetic attitude of the administration and department heads, or for divers other reasons. But for the most part centralization is a vital factor in the supply system of the cities embraced in this discussion.

The Department of Education in many cities is practically autonomous. Educational supplies are almost universally bought independently of the regular municipal agency. In some of the larger cities, such as Cleveland,

OUTLINE MAP SHOWING PRESENT EXTENT OF CENTRALIZED PURCHASING IN CITIES OF UNITED STATES AND CANADA



the Department of Education maintains and operates its own supply bureau.

The city manager movement has been a powerful factor in the spread of centralized buying. It is only natural that supply procurement should be centralized by city managers along with other phases of the government. Of 100 city manager cities in the United States and Canada of over 10,000 population, 79 are known to practice centralized purchasing. In most municipalities under 25,000 population, the city manager himself does the buying for the city. In the larger cities, a purchasing agent is usually appointed by the city manager or by the head of the finance department.

The accompanying map has been prepared especially to show the present extent of centralized purchasing in municipal government. A circle is superimposed on each state or province to show the extent of the plan in that area. The upper figure in the circle gives the number of cities in that state or province with legal provisions for centralized purchasing. The lower figure gives the ratio of the total population of those cities to the total *urban* population of the state or province. For example, 11 cities in Michigan follow the centralized method of buying. The total population of those 11 cities equals 63 per cent of the total population of *all* cities of Michigan. In the province of Ontario 4 cities with central purchasing agencies are equal to only 4 per cent of the total *urban* population of the province. The shading and vertical lines are intended to convey this fact graphically.

The relationship of the city manager movement to centralized purchasing is apparent from the record of California, Michigan, and Texas, as shown on the map. These states, which lead others in number of city manager municipalities, are also near the top in number of cities with central agencies of purchase.

The following table classifies the cities of the United States with centralized purchasing into six population groups, according to the latest available census figures (the Census Bureau estimates for 1922). It shows the total number of cities in each population group, the total number with centralized purchasing in each group, and the per cent of this number to the total number in the group:

Population Group	No. of Cities 1922	No. with Centralized Purchasing	Per Cent with Centralized Purchasing
10,000- 30,000	459	75	16%
30,000- 50,000	107	31	29%
50,000-100,000	79	19	24%
100,000-300,000	52	29	55%
300,000-500,000	11	7	63%
Over 500,000	12	11	91%

Centralized purchasing is just in its infancy in American cities. But the present extent of its practice in both the United States and Canada shows that it is already a "going" factor in modern municipal administration.

Circulars and Newspaper Questions and Answers Replace Annual Reports

To the Editor of THE AMERICAN CITY:

The suggestions appearing recently in your columns regarding the publication of annual reports have been inspiring.

I have always felt that the publication of an annual report in considerable detail has been an expense to the city which does not justify itself in any substantial return. We are all agreed that the great majority of citizens neither get nor are interested in the usual municipal report. The size of the publication itself discourages the citizen before he opens it.

Though we in East Cleveland have not gone all the way, we have started in what we believe to be the right direction. During the past year we have been publishing, whenever the occasion provides, a circular informing the citizens what we have done or intend to do and what results the administration of their affairs has attained. These circulars are made as brief and attractive as is reasonably possible and are distributed by boys to every residence.

I think that an additional interest might be stimulated to insure the saving of these circulars, by offering the readers a cheap loose-leaf folder in which the circulars, all of the same size (8½ x 11 inches), can be filed. Such folder covers, with rings, can be obtained by the city at about three cents each. The residents desiring them could be required either to call for the folder at the City Hall or to write for it. The addresses thus secured would provide a list of the most substantial citizens, which would come in handy in many ways. Many interested citizens and supporters would thus be discovered who were not previously known by the administration.

As another means of stimulating interest in city affairs, we have provided a list of one hundred questions and answers—which could be enlarged indefinitely—three questions to be published in the local newspaper each week. The questions ask about various features of the city government. The following week the answers are published, along with three additional questions. The circulars and the questions and answers could both be used effectively, I believe, in connection with the teaching of civics in the schools.

The compilation of a hundred questions and answers is supplemented by a summary of our various public service contracts and franchises, and to this are added copies of each circular letter which has gone out to the citizens. These are bound in the office and serve as immediate answers to the great number of questionnaires which we receive regarding the administration of city manager government in our city.

PAUL B. WILCOX,
Assistant City Manager, East Cleveland, Ohio.

Low Tax Rates, Large Utility Earnings

By Richard Biehl
City Manager, Village of Westerville, Ohio

EDITORIAL NOTE.—*Whether it is sound practice to finance a municipality largely from profits of its public utilities is a debatable question; but Westerville, Ohio, seems so well pleased with this method of reducing the tax rate that the City Manager has furnished, for the benefit of* THE AMERICAN CITY'S *readers, the following outline of financial methods and recent public improvements in this thriving Ohio village. Westerville's population in 1920 was 2,480. It has been operating under the commission-manager form of government for the last eight years.*

THE citizens of Westerville are somewhat elated over their low tax rates and the fact that the major operating costs of the municipality are paid from the earnings of its utilities.

For the year 1923 the total expenditures for the operation of the various departments, including sinking fund requirements, were $82,235. A tax was levied that would produce $16,700. Only 4 per cent of the tax money was used for operating expenses, and 96 per cent was placed in the sinking fund to be used for the redemption of bonds and for interest requirements. The city earned sufficient money from its utilities to pay all of the major operating expenses, including the salaries of the city manager, his assistants, and secretary, and to pay for $13,600 worth of improvements.

Westerville has its own water plant. Electric current is purchased wholesale and is retailed for power and light through a municipally owned distribution system. All water is pumped with electric motors at a big saving over the old way. No charge is made on the village books either for water for municipal purposes, or for current used in street lighting, and the schools are supplied with water gratis.

The rates charged to consumers for water are $2.00 per 1,000 cubic feet up to 15,000 feet, and $1.75 per 1,000 for all over 15,000

GLENWOOD DRIVE, WESTERVILLE, OHIO

feet, with a minimum charge of $2.00 a quarter. Readings are taken quarterly.

Electric current is sold by the village at an average charge of 4 cents per kw. hr. to citizens, 10 per cent being added for all current sold outside the village limits. Farmers in the vicinity of Westerville have subscribed more than $6,000 for electric lines to be constructed by the city and to become its property. None of the money paid by the farmers for the construction of these lines is refunded.

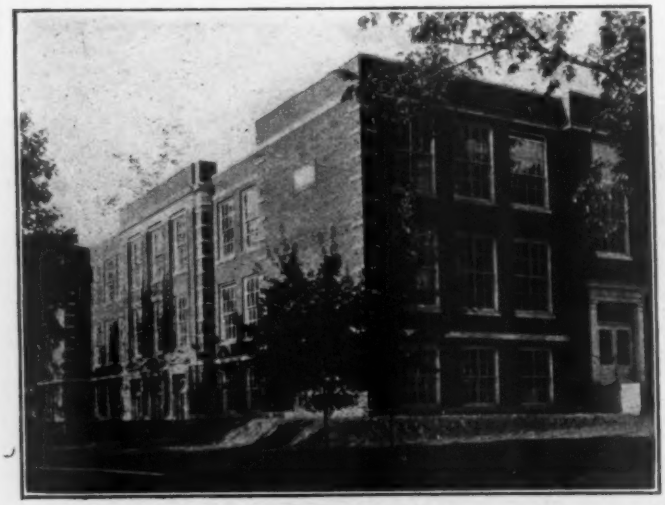
Westerville purchases its current from a privately owned Columbus plant and pays most of the operating expenses of the village from the net earnings, although selling current at rates averaging 3 cents per kw. hr. below the consumers' rates charged in Columbus.

Recent bond issues for public improvements are all issued for short terms, resulting in substantial savings in interest payments. The sinking fund is in an excellent condition, and is building up a big surplus each year. It takes 65 per cent of the present tax money to meet obligations on bonds which were issued between 15 and 22 years ago. These old issues have been refunded and placed on a serial plan basis, with a saving in interest of more than $65,000 on these old issues. Under the present plan of financing, interest payments are decreasing at the rate of $1,500 a year.

CARNEGIE LIBRARY IN WESTERVILLE

Every city employee is well paid, and each one must live up to a certain standard or be replaced by another. Although the city's business has increased more than 50 per cent the past two years and duties have multiplied, by practicing efficiency the expenses are very little higher. This has been made possible in part by the use of the latest and most modern equipment to facilitate the work of cleaning the streets, in laying sewer and water lines, to remove rubbish, and in the execution of all city work.

Westerville has many of the facilities of the big city, and is known as the "biggest little city" in central Ohio. The following are some of its improvements: ninety per cent of its streets paved; sewer and water on almost every street; light and power on every street; all streets well lighted; a new sewage disposal plant; a new water filtration plant under construction; its own electric distribution system; its own water-works; a good system of schools, including a new $200,000 high school; good sidewalks; and a community hall. Westerville has motorized fire and police departments. Fire losses and insurance rates are low. The police department is supported by the local business men, who pay a certain sum each month when they pay their light bills. The accounting system is one of the best, with an accurate set of



WESTERVILLE JUNIOR-SENIOR HIGH SCHOOL

records, and with the latest facilities for rendering statements and keeping a constant check on power, light and water consumers.

Westerville banks bid as high as 4⅓ per cent on the excellent balances now maintained. At the beginning of the year 1923 there was a balance of $448.81 in all funds. We placed only $652.35 of tax money in the operating funds and at the close of the year all current bills and $13,600 of improvements had been paid for, and more bonds retired, and we had $17,000 cash in the bank. Our funds were secured by making each department pay its own way and from the net earnings from the utilities.

We have planned to place all tax money in the sinking fund this year and use earnings and fees for operating expenses.

A Crusade for Better Childhood

By William A. McKeever, A. M., LL. D.
Lecturer on Juvenile Problems

SIXTEEN towns, all within a radius of 40 miles from Chicago, are engaged in a friendly contest to determine which of their number may prove to be the best place in which to rear the young. This is the same type of campaign which I conducted twice in the state of Kansas and more recently as a state-wide project in Oklahoma. In order to stimulate interest in the present movement, the Chicago *Evening American* has posted a prize of $1,000 to be awarded to the winner. The contestants are these:

Barrington.—A live country town, with a well-managed system of schools, a progressive and self-directive citizenship, healthy conditions as to churches and community life, and comparative freedom from city influence.

Berwyn.—A close-in suburban place that is fighting ably for independent self-direction of its civic and moral life; possessing an effective community-service organization, ably managed health work and parent-teacher affiliations with all schools.

Blue Island.—A semi-industrial population, with excellent advantages as to schools, women's and parents' clubs, a church conducting a regular civic forum, many other organizations helping with the common welfare, and a splendid paper supporting all.

Desplanes.—A town which has long stood for a high moral conscience, for well-supported churches, for self-discipline of pupils in the high school, for women's clubs with a zeal for service, and for an ideal suburban existence.

Downers Grove.—A town with homogeneous, rural-minded population; having a civic club which unites all factions, a progressive school system, excellent kindergarden service, well-filled churches of many denominations, and a central committee to manage the campaign.

East Chicago.—A big, thrifty industrial town, with all schools on the departmental plan, Boy Scouts assisting as traffic officers, a wide-awake chamber of commerce, music, and gymnasium instruction in the schools, and women's clubs supporting all juvenile movements.

Elmhurst.—A town of attractive homes and pride in home life of the young; a Lions' club conducting a civic forum, a community church furnishing a social center for all, a high school that is well managed and enjoying the seclusion of the country, and excellent churches.

Hinsdale.—A town which has succeeded in uniting its grade and high school systems, with music, gymnasium practice, and the manual arts as features; a union church having a Sunday School of 800, and a system of caring for the morals of all the young.

Forest Park.—A place of wide-awake civic interest; with a Kiwanis Club which directs much of the civic life, with a women's club which studies and supports better home conditions for the young, and a school management which links up with the affairs of the community.

Glencoe.—A restricted residence community; having a club of business men which meets weekly to consider community welfare, a union church which serves many denominations, a public school wherein the children largely rule themselves, and many advantages for clean child life.

Glen Ellyn.—A town well set apart from the big city; with a high school that has become conspicuous for its support of the after-school interests of its pupils, churches which ably attend to the religious needs of the young, and a helpful weekly newspaper.

Hammond.—A thriving industrial center; with a chamber of commerce and women's clubs giving able support to the child welfare work, with public school management that has attracted national recognition, with moral ideals functioning in the schools and with able daily papers.

Harvey.—A town of long-standing ideals of citizenship; having a chamber of commerce with many civic achievements to its credit, a women's club featuring child study, a grade-school movement for better morals, and a high-school program of country-wide fame.

La Grange.—A close-in town where the home life comes first as a consideration of well-being; a civic club of men and women assuming directive control over all community movements; a woman's club that conducts child welfare work with the seriousness of a school.

Waukegan.—A hustling, well-balanced community; having exceptional schools and school equipment, churches featuring juvenile work, a complete continuation school, civic organizations assisting with all worthy movements, two daily papers, and a working committee of 100.

Wilmette.—A high-grade, restricted residence community; having a Sunday Evening Club of wide repute, which peculiarly unites all churches, a junior police force assisting with city government, modern public and parochial schools, and a complete system of Sunday schools.

The Central Problem

As director of Better-City campaigns, I have found the central problem to be that of cooperation and coordination. Practically all these places have an ample number of organizations, and they are sufficiently interested to take proper care of their growing young. But the work is nowhere well tied together in a single, effective movement. We recognize the four old and well-established institutions as being responsible for the care and management of the young, namely, Home, School, Church, Community. If any one of these fails, all must find a lower level: but if all act consciously together, the well-being of the child and the youth is reasonably assured.

The contest is running through an entire year and will presumably close about the first of June. I visit these places by turns, or send a representative, meeting committees, addressing clubs of men and women, inspiring the workers, arranging for publicity, and organizing the movement centrally. The majority of the towns on the circuit have given me the advantage of one or more central gatherings, where the Better City Campaign was explained.

Recently, the majority of the places have sent in for publication in the daily press a list of their "ten best points" as child-fostering communities. Some of them have arranged large bill-boards to be displayed along railways and to announce the virtues of the places, while a few have even gone so far as to send large beaver-board posters to be set up in a display window in the Loop district of Chicago. The *Evening American* has given splendid support to the campaign, with scores of press items, and with numerous photo-picture illustrations. This paper well appreciates the fact that child life may be made sufficiently attractive to become worthy of news column display.

Finally, in order to give the movement specific guidance, I have sent out to all the working committees a complete list of suggested projects intended to make the effort easier and more effectively coordinated. The interest in the campaign has grown slowly but solidly from the first, and I believe that the effort has been entirely worth while.

The Score Sheet

The score card which will be used as the basis of competitive grading of these towns on about the date of June first, follows:

1. Facilities for play and athletics, about the home, the school and the community
2. Educational advantages, in public and privately managed schools of all grades and classes
3. Industrial and vocational training, the emphasis being placed on industrial practice as discipline
4. Health and sanitary measures; preventive methods and educational health practices being first
5. Home life and housing, with the emphasis on convenience and comfort for family rearing
6. Community morals and social direction, especially as to community advantages for children of high school age
7. Encouragement of religious training, considering status and advantages without reference to sect or creed
8. Coordinated efforts of workers, especially those representing home, school, church and community
9. Publicity and propaganda, through press, bill-boards, circulars and public addresses
10. Organization and methods used in the accomplishment of the local work of the campaign

In the main, the acting committees will be asked to make a showing, first, of the physical equipment and the visible situations; second, the brief verbal report of heads of departments of the work; third, the preserved and prepared written and printed account of the local undertaking.

Child Health Demonstration in the Far West

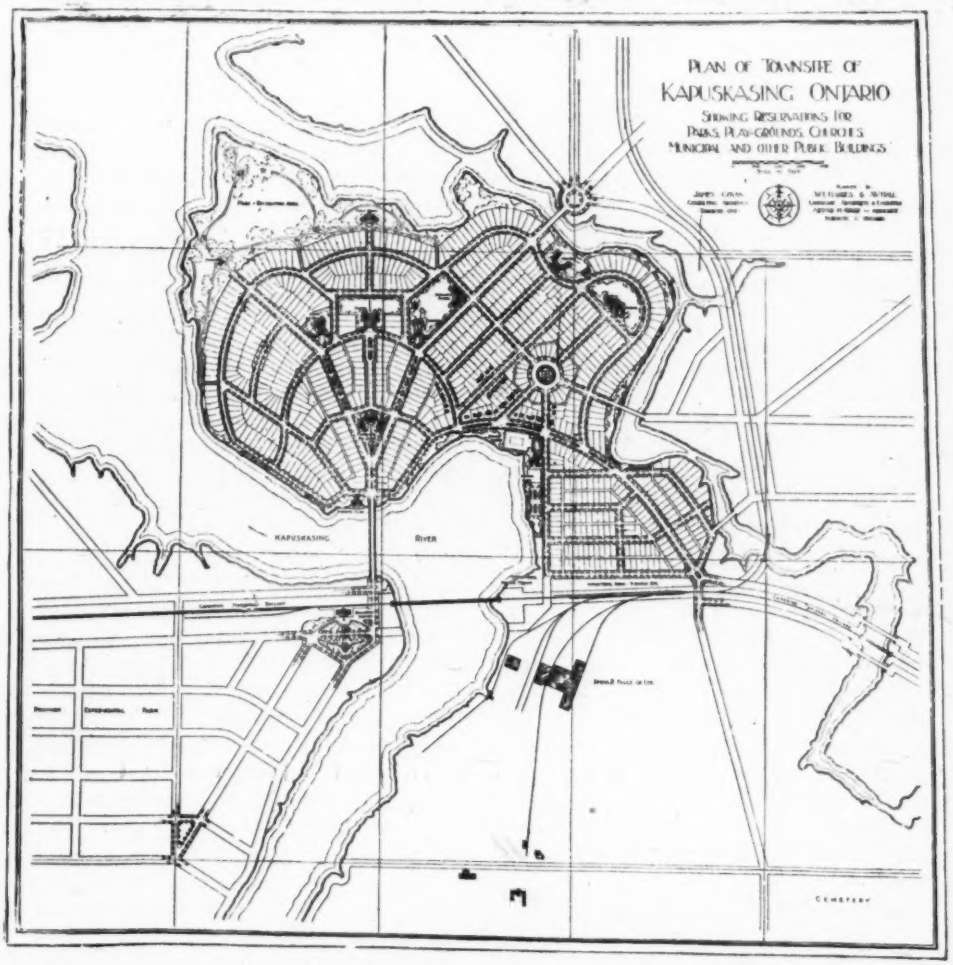
ANNOUNCEMENT has been made that the fourth in the series of five-year child health demonstrations now being conducted by the Child Health Demonstration Committee, associated with the American Child Health Association for supervision of the Commonwealth Fund Program, will be awarded to some city or county in the far West. The city or county must be between 20,000 and 75,000 population and be located in one of the following states: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington or Wyoming.

Aside from size and locality, the choice of the community will be based upon a review of the health situation and the needs of the community and the sincerity of the community's desire to develop a complete and rounded plan for a child health demonstration.

Development of a New Town in Canada

By J. A. Ellis
Director, Bureau of Municipal Affairs of Ontario

IN the lumber manufacturing region of Northern Ontario, along the route of the Canadian National Trans-Continental Railway, about 70 miles west of Cochrane, the new town of Kapuskasing is being developed. Here are located the mills and other works erected by the Spruce Falls Company for the extensive manufacture of pulpwood. In striking contrast to the haphazard growth of many new lumber towns in the past, the development of Kapuskasing is being planned and carried out according to the best modern practice in town planning, as set forth by officials of the Government of Ontario.



This town was incorporated in the year 1921 under an act authorizing the Government to enter into an agreement with the Spruce Falls Company for the laying out and establishment of a town site and for the provision of model housing and other accommodations for employees of the company and others who may become residents of the town. Preliminary visits were made to Kapuskasing by government officials, and topographical maps of the region were prepared and studied before the site of the new town was decided upon. In making the selection, one of the most important considerations was the fact that the Company had acquired rights to develop two power-plants on the Kapuskasing River, which, when completed, will raise the level of the river to some extent, and consequently flood

CONSTRUCTION UNDER WAY IN KAPUSKASING

a large area of the surrounding land. The site selected has an elevation sufficient to meet all requirements, and when the river-level is raised will have the advantage of being almost entirely surrounded by water.

The area set aside for the municipality covers 2,053 acres, of which a comparatively small part, 220.8 acres, has been subdivided and laid out as a town site. This site, in addition to a large portion of the other land included within the limits of the municipality, is owned by the Province. A number of lots have been reserved for the Company, some have been set aside for the Housing Commission it is proposed to establish, and the remaining lots have been placed on the open market. The subdivision made will accommodate about 2,500 inhabitants, and further subdivisions will be made as the population increases. In leaving the large area of unsubdivided land surrounding the town site, the town planners aimed to prevent the erection of houses of an undesirable character in the immediate vicinity of the town, and also to assure the municipality of control of the development of land, business and health conditions in this surrounding territory.

In the general town plan, a street system has been developed which adequately provides for the present needs, and which can also be easily extended or linked up with new streets opened at a later date either inside or beyond the municipal limits. A main business area has been reserved for the erection of business structures of a permanent character, and a secondary business area has been set aside for the erection of buildings of a temporary character, immediately required by the new town. Appropriate locations have also been provided for municipal buildings, schools, churches, hospitals, etc. The lands along the river-front surrounding the town, being somewhat too low for building purposes, have been reserved almost entirely for park and recreational areas.

During the past year building construction in Kapuskasing has made rapid progress. Ninety-four houses have been completed, with sewerage and water services installed and connected. A public school, hospital, community hall, a new railway station and one unit of a good hotel are some of the other structures that have now reached completion.

While Kapuskasing is not what is known as a "company" town, the water-supply for the community is being obtained at cost from the Company's plant, thus eliminating the expense of operating an independent pumping-station. The distribution system has been so designed as to take care of modern fire protection requirements, and hydrants have been placed at convenient points. Sewers and a sewage disposal system of sufficient capacity to take care of the needs of the anticipated population of the town for several years to come have been installed, and as both the sewerage and the water-works system are being built in units, they can be gradually extended to meet future needs.

This town planning project has been carried out entirely under the direction of the Bureau of Municipal Affairs of Ontario, and all surveys and plans have been handled solely by officials of the Ontario Government.

A PLEA FOR MOTION PICTURES IN THE SCHOOLS AT NIGHT

There is no more senseless extravagance than great masses of costly school masonry dead, inert, useless, night after night, when they might be throbbing with life and light while the community, through visual representation, received an educational and spiritual uplift.—SUSAN M. DORSEY, *Superintendent of Schools, Los Angeles.*

Chamber of Commerce Activities in Public Affairs

Zoning Legislation Secured for South Carolina

CHARLESTON, S. C.—A recent worth-while accomplishment of the Charleston Chamber of Commerce has been the passage by the South Carolina Legislature of a zoning enabling act. This act was signed by Governor McLeod on March 22.

Last July an intensive study of zoning was undertaken by the Chamber of Commerce, following which the importance of this method of regulating the future growth of cities was called to the attention of all chambers of commerce in South Carolina. A number of speeches on the subject were made in different parts of the state by the Manager of the Charleston Chamber and by Dr. R. S. MacElwee, Commissioner of Foreign Trade and Port Development.

As a result of the study of the problem, it was decided to submit to the Legislature for adoption the Zoning Enabling Act which had been prepared by the Advisory Committee on Zoning, appointed by Secretary Hoover of the United States Department of Commerce. This act was strongly supported by other chambers of commerce throughout the state and was passed by the House and the Senate without material opposition.

In connection with this work the Chamber of Commerce brought to Charleston Hon. Edward M. Bassett, Counsel for the Zoning Committee of New York City, who addressed a large joint meeting of the Chamber of Commerce and the Rotary, Kiwanis, Lions and Exchange Clubs, and explained the application of zoning to the city.

Now that the proposed act has become a law, immediate steps will be taken by the Chamber of Commerce for the appointment of a committee to study carefully the local situation and recommend to the City Council what, in their opinion, would constitute a practical and adequate ordinance for Charleston, so that we may intelligently control the future industrial growth of the city, protect the homes of property owners from damage, and increase the value of such property as may be used for business purposes. As Mr. Bassett pointed out in his address, proper zoning regulations tend to increase all property values throughout the city and make them permanent.

MEIGS B. RUSSELL,
Manager, Charleston Chamber of Commerce.

A State-wide Campaign for Adequate Public Health Work

NASHVILLE, TENN.—Chambers of commerce throughout the state of Tennessee are now conducting a campaign for an increased appropriation by the next Legislature to the State Board of Health, which will enable this important department to function in the proper manner and raise the standing of Tennessee in public health work. Civic clubs, farm bureaus and the medical profession are also aiding in the campaign.

The question of the small appropriation made by the Legislature each year for public health work came up for discussion at a meeting of representatives from all the chambers of commerce of Tennessee held at Nashville on October 9 last. Unanimous approval of the proposed campaign was voted, and the Nashville Chamber of Commerce was asked to take the lead. The state was divided into four sections, the Nashville Chamber taking the middle counties, the Memphis Chamber the west counties, the Chattanooga Chamber the lower east counties, and the Knoxville Chamber the upper east section.

Sectional meetings were first held in each of the four cities mentioned. Prominent business men, physicians, and members of the chambers of commerce and civic clubs were invited to attend. The proposition was placed before them both by lay speakers and by medical men; the plan of campaign was announced to them, and in each division instant approval was given.

Each of the four chambers named agreed to take the message to the counties in its section. They selected both laymen and medical men to speak in each county-seat. In turn, each county chamber of commerce—or, where there is no chamber of commerce, some civic organization—undertakes to carry the message to the people of each village and hamlet in that county, so that the entire state will be

completely covered when the campaign is through.

The need for more attention to public health is explained to the voters, and they are asked to see that men are sent to the Legislature next year pledged to make an adequate appropriation to the State Board of Health. The state at this time is spending over twenty times as much for the care and cure of unfortunates confined in its eleemosynary institutions—25 per cent of whom are there from the effects of preventable diseases—as it is appropriating for prevention through the State Health Department. An increased appropriation for preventive work would ultimately make possible a substantial decrease in appropriations for care and cure.

The newspapers of the state have given liberal space to the campaign. Weeklies and dailies are running stories sent out by the Nashville Chamber of Commerce, these stories being prepared by prominent laymen and medical men who are interested in public health. The cooperation being rendered by members of the medical profession in the whole campaign has been most gratifying.

Child Health Day

ST. PAUL, MINN.—Child Health Day was celebrated for the third year on March 28, in the St. Paul Auditorium, with an all-day program on which appeared such authorities as Angelo Patri of New York, Dr. Caroline Hedger of the Elizabeth McCormick Memorial Fund, Chicago, and Dr. Edith Hale Swift of Johns Hopkins University.

Child Health Day was sponsored by the General Federation of Mothers' Clubs and the St. Paul Association with the cooperation of many other social and civic organizations. Posters and placards bearing the slogan "It's Great to Be Healthy," with the picture of a boy running with a kite, were widely distributed. Thousands of persons heard the program in the Auditorium.

St. Paul has led the nation in the observance of Child Health Day. Since our first program many municipalities have written to us for information and have launched similar undertakings. Within the past month President Coolidge has issued his proclamation setting aside May 1 as National Child Health Day. The President declares that the purpose of the day is "to focus the thought of the country on constructive measures for improving and safeguarding the health of the nation's children." The American Child Health Association is now asking the cities of the United States to observe the day in accordance with the President's request.

St. Paul is convinced that Child Health Day is a great civic asset. As Mayor Arthur E. Nelson said in his proclamation for the day: "We are all anxious to see St. Paul prosper and grow, but in our desire to improve our environment and conditions we must not neglect the lives of the children who in a few years will be sharing the civic responsibilities with us."

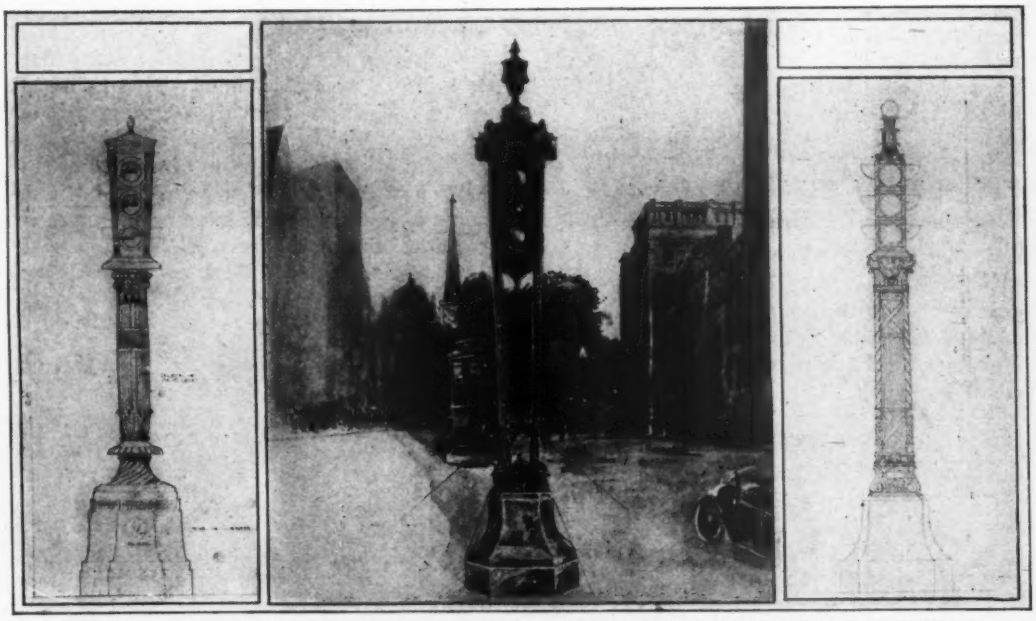
The St. Paul Association will be glad to give detailed information on the day to any who apply.

S. A. BOWING,
Associate Secretary, St. Paul Community Chest.

A Study of Local Housing Conditions

KLAMATH FALLS, ORE.—A growing housing shortage in Klamath Falls has resulted from the construction work on the "Lakes Route," now under way by the Southern Pacific Company. This new line, which will result in a more direct route than heretofore between Portland and San Francisco, is the greatest piece of railroad construction now under way in the United States, tapping a great timber and agricultural area.

Klamath Falls, a city of some 7,500 people, through which the Lakes Route will pass, has been growing so rapidly that families were forced to live in storerooms and tents. The housing situation, therefore, became an important problem for the Klamath County Chamber of Commerce. As a first step it was evident that definite facts were needed as a



DESIGNS WINNING FIRST PRIZE (IN CENTER), SECOND PRIZE AND HONORABLE MENTION IN NEWARK COMPETITION FOR TRAFFIC TOWERS

basis for action, in place of a merely "general knowledge" of a housing shortage.

A Home Building Committee of influential men was appointed. This committee called into conference various other groups, and for the purpose of the survey divided the city into ten precincts. For each precinct a captain was appointed, who in turn appointed ten men from his district. Blanks were prepared, one for each family, and a house-to-house canvass was made.

As a result of this survey, the committee is able to proceed intelligently with its development plans. The questionnaires show not only the number of persons occupying each of the existing houses, but also the important fact that 339 persons signified their desire to purchase homes on an installment basis, while 188 others stated that they are able to build or finance new houses to rent or sell.

LYNN P. SABIN,
Executive Secretary, Klamath County Chamber of Commerce.

Competitive Designs for Traffic Towers

NEWARK, N. J.—At the first annual meeting of the Broad Street Association, in March, 1923, the Traffic Committee brought in an exhaustive report which was adopted by the Association. It included a dozen or more suggestions to the City Commissioners for the improvement of traffic on Broad Street. Among these was the suggestion that a traffic-control lighting system should be established which would unify the flow of traffic through the business center of the city.

This suggestion met with the approval of Commissioner Brennan, Director of Public Safety, and through his efforts provision was made for this in the tax budget of 1924.

Since this meeting last year, members of the Traffic Committee and of the Newark Police Department have been studying systems in use in other cities throughout the United States. They found several satisfactory systems in use, but in no city did they see a traffic signal post which they thought suitable for Newark. The Traffic Committee therefore called to its assistance the Committee on Architectural Harmony of the Association, and these two committees laid the matter before the New Jersey Society of Architects.

With the approval of Director Brennan, a competition for the design of a standard for traffic regulation, open to the architects of Newark, was held, under the auspices of the Society of Architects, prizes being offered by the Broad Street Association for the best two designs submitted. From the work of a large number of architects five designs were selected, any one of which would be an ornament to the street. The first prize was awarded to Nathan Harris and the second prize to George W. Backoff and W. Pierre

Aquin. The award took place at the monthly meeting of the New Jersey Society of Architects, on April 10, 1924, the presentation being made by the retiring president of the Broad Street Association.

OGDEN H. BOWERS,
Executive Manager, Broad Street Association.

University of Illinois Training Senior Students for Chamber of Commerce Secretaryships

Eighteen seniors at the University of Illinois are taking advantage of an opportunity, made available in February, to secure special training for the career of chamber of commerce secretary. This new course—offered, it is believed, by no other major American unisity—is the result of the unusual interest taken in chamber of commerce work by Dr. Charles M. Thompson, Dean of the College of Commerce and Business Administration at Illinois. A special feature of the course is the lectures and conferences each Thursday by active secretaries from various Illinois cities; those cooperating in this way during the present semester including the chamber of commerce secretaries from Springfield, Kankakee, Peoria, Bloomington, Decatur, Danville, Urbana, LaSalle and Joliet, and the general and legislative secretaries of the Illinois Chamber of Commerce.

A statement issued by the Bureau of Business Research of the University, in referring to investigations made by the eighteen members of the class, says:

"These investigations reveal the transition of the average chamber of commerce from a trade organization to a civic association. The class has learned that the present chamber of commerce almost represents the community at work, that it tends to operate as an informal city council, without authority other than moral suasion. A survey of the activities of the chambers of commerce in Illinois indicates that a composite chamber of commerce in that state performs at least 121 functions in its civic division alone, not to mention many more activities in its traffic, industrial, merchants', and organization (actual operation of the chamber) divisions. The relation of the dinner clubs with the chamber of commerce, the question of community endowment, and intercommunity visitations are among the more recent developments in the work."

Awards in Interchamber Fire Waste Contest

The award to the Chamber of Commerce of Hoboken, N. J., of the grand prize in the Interchamber Fire Waste Contest, conducted by the National Fire Waste Council, has been announced by the Chamber of Commerce of the United States.

The first prize for cities of the first class, over 100,000, was awarded to Indianapolis. For cities of the second class the prize went to Hoboken; for cities of the third class, to Dubuque, Iowa, and for cities of the fourth class, to Blytheville, Ark.

The award is based on fire losses and fire prevention measures. Hoboken showed a reduction in fire loss of 67 per cent for 1923 in comparison with the average for the preceding five years, or a reduction from $449,224 to $157,041.

For all of the cities entered in the contest and submitting reports, the fire loss for 1923 was $3.24, compared with $4.75 for the whole country in 1922. As a result of the efforts made by the sixteen honor cities, a reduction of 13½ per cent in per capita loss, compared with the preceding five-year average, and a decrease of 34 per cent in the number of persons killed and injured, were accomplished.

Two hundred and two chambers of commerce in forty-three states are entered in the national contest.

Kiwanis Club Presents Automatic Sprinkler System to Hospital

AN interesting example of civic service by a luncheon club is reported from Huntsville, Ala., where the Kiwanis Club has presented to the local hospital a complete automatic sprinkler system. The gift was financed by three annual entertainments, starting with the "Jollies of 1922." In telling of this undertaking in its issue of April, 1924, the *Grinnell Automatic Sprinkler Bulletin* makes the following statement regarding the service of civic organizations:

"The club felt in making this unusual presentation to the hospital that it was giving the greatest thing it could give—real safety to life for the occupants of the hospital. Those who are unfamiliar with the inner activities and motivating spirit of civic and fraternal organizations are apt to think that such organizations exist primarily to initiate new members, parade, hold lunches and listen to speeches. As a matter of fact, such activities are only superficially apparent. Behind all such organizations there lies a firm, fine foundation of human service."

"Government by Default"—Cause and Cure

By William P. Lovett
Secretary, Detroit Citizens' League

GOVERNMENT is one of the few agencies which touch all the people at many points, for good or ill. Yet one of the greatest weaknesses of all popular government is lack of contact between the government and the people—between the corporation and its stockholders. City government is not only a matter of business, but a matter of people—it must be human in quality or it fails.

It is said that every city is governed as well as it deserves to be. This is true when the people have access to the facts. If they are not interested, they do not care for facts. But many times the people cannot get the facts even if they try, and so they get discouraged and careless about all government. This civic indifference, accounting for the light vote at many elections, is the greatest handicap on good government to-day.

Shall We Continue to Have Government by Minorities?

For the situation here described, lack of proper methods in reporting government to the people is largely responsible. Until this problem is solved, the whole question of our American democracy will still be left hanging in the balance. The measure of success in good government is largely determined by the measure of citizen interest and civic cooperation. Such interest and cooperation either depend upon, or go together with, adequate methods of reporting government to the people. The man or group of men who can solve this problem will become great in American history.

"Government by default" is a good name for this situation. It is the exception rather than the rule in American elections when a majority of the qualified voters cast any ballots at all at a given election. This means government by minorities. The great majority of "good" citizens, not having the facts and being indifferent, permit an alert and frequently corrupt minority, with only selfish interests to serve, to dominate the particular unit of government.

The public should be a party to government transactions before, not after, the decisions are made. Every good city official will want to have the citizens informed. It is only the grafter or professional politician, with selfish ends to serve, who wants the people to be kept in ignorance of city affairs. The great majority of officials are facing a seemingly insoluble problem: how to get the facts to the people so they will be understood and the people will maintain continuous, intelligent interest in their government. Nobody has yet furnished a final solution to this problem, but many things can be done to help solve it.

The citizen should know the facts because, if he believes they are kept from him, he becomes suspicious and careless, and at election time he is easily stampeded by false propaganda. If the city waits till election time, the thing gets too hot, and real facts cannot be imparted so as to be accepted. At elections some of the candidates are likely to be seeking to conceal facts and distort the truth, so as to get votes. Most citizens discount political statements made in election campaigns; they assume personal bias. But since the people, at elections, register decisions on government as to candidates or issues, it is essential to try to keep the public informed during the whole year.

In making the city budget there are vast fields yet to be cultivated for getting to the public the facts regarding taxes. The average taxpayer knows so little about the whole subject of city financing that he makes no inquiry about the units of service for which the money is spent; he simply kicks on the size of his total tax bill, or throws out a chest and condemns the tax rate, which of course is always, from his standpoint, too high. Public ignorance and unfounded suspicions are the soil in which many a capable administration has allowed seeds of distrust to grow, till they have upset the whole helpful program and ousted good men from public office.

The newspapers cannot alone solve this problem—if they can, they have not yet done

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it. Newspapers exist chiefly to print news, or what the editors thinks the people want to read, and many facts in the city hall are not news in that sense. Or, the information is furnished by the press, not logically, connectedly, and continuously, but piecemeal, so the citizen is confused and largely in ignorance. To some extent newspapers, though recognized as an unofficial branch of the government, are in danger of suffering from their own bias in opinion, or the reader attributes bias to them. The press also is subject to laws against libel, if it prints all it knows.

Another handicap is the fact that people think and talk, not of government in the true sense, but of politics in the bad sense, and thus they do not expect the truth. They assume that any man in public office may be a crook, hence cannot give the facts—he is only a "politician." Now this is a bad situation, because the man on the job, at the head of a city department, ought to know the facts, and ought to be accepted as the authority in that line.

Many other methods have been suggested and used, in various cities, including departmental reports, which generally are so technical, statistical, or otherwise unreadable, that they are not read at all by the average taxpayer. Yet bulletins and municipal reports are essential to reporting government. Another excellent method is that of municipal exhibits.

Why Not an "Information Official"?

Experience shows that while no single method of reporting government can alone solve the problem in every case, a combination of methods can best be used, with emphasis locally on that method which best fits the case. Municipal publicity may well be delegated to a specialist in every city, who makes of it a study and a practice.

Such an information official should be qualified and authorized to organize his work, call on city officials for articles, reports, addresses, etc., and send speakers where they may be needed to tell the people what they want to know. He should get out interesting, attractive, illustrated leaflets, reports, folders, etc., and make use of every available channel of publicity, including motion pictures and municipal exhibits.

Special attention should be given to the use of the press. In some cases possibly a single newspaper can be persuaded to set up and maintain a department of municipal information, highly organized, and constituting an advantage to the city and to that newspaper. The motion picture already has been used effectively, with slides for the stereopticon, in connection with all sorts of municipal projects.

I believe the best principle to adopt is to take the government to the people rather than ask the people to go to the city hall. Utilize meetings already arranged, where citizens gather. Make use of the public schools, churches, clubs, and even the pulpit and platform for municipal information. Great results have been achieved through civic clubs, the research bureau method, both private and public, and the speakers' bureau. By adapting all these to local conditions, the handicap of public ignorance by slow degrees, over periods of years, can be overcome, and the effectiveness and success of city government can be doubled.

ACKNOWLEDGMENT.—A summary furnished to THE AMERICAN CITY by the author, based on an extended address recently given by him before the Illinois Municipal League.

West Virginia Joins List of States Having Municipal Leagues

BY the organization of the West Virginia Municipal League, another state has been added to the growing list of states whose municipalities are organized for mutual aid in promoting better city government and community welfare.

The organization meeting of the West Virginia League, held in Clarksburg March 20, resulted in the election of the following officers to serve for the first year: Harrison G. Otis, City Manager of Clarksburg, President; W. T. McCreery, Mayor of Wellsburg, first Vice-President; Herbert Stansbury, Mayor of Beckley, second Vice-President; John L. Ryan, Mayor of Fayetteville, third Vice-President, and Dr. David Littlejohn, City Health Officer of Bluefield, additional member of the directorate to serve for one year until a past president is available to complete the membership of the board.

The annual dues for member cities and towns will range from $10 for places of less than 1,000 population to $100 for cities of more than 30,000 population. The League Secretariat and Bureau of Municipal Research and Information will be established at the State University at Morgantown under the supervision of Nat T. Frame, chairman of the University Extension Committee, who has been named Executive Secretary.

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PRACTICALLY every city department of Philadelphia is saving expenses with Autocars. The Street Cleaning Division for making curb collections of ashes and rubbish; the Bureau of Highways in street and bridge repair; the Electrical Bureau for overhead and underground construction; the Bureau of Health and Hospitals for transporting supplies; the Bureau of Water for construction and repair work; the County Prison, the Board of Education, the Free Library, and the House of Correction for miscellaneous hauling.

This impressive fleet of Autocars, bought over a period of 13 years, offers a convincing proof that Autocars, because of their short wheelbase handiness and economy of operation, are the most efficient trucks for municipal service.

Furthermore, each Autocar is assured more continuous operation by the expert servicing facilities of the nation-wide system of Autocar Direct Factory Branches.

Capacities from 1 to 6 tons

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Ardmore, Pa.

Branches in 46 cities

Autocar

gas *and* electric trucks

EITHER OR BOTH - AS YOUR WORK REQUIRES

Hints, Helps and Happenings

Proposed Standard Smoke Ordinance

A TENTATIVE draft of a Standard Smoke Abatement Ordinance has been prepared by a joint committee made up of representatives of the American Society of Heating and Ventilating Engineers, the Stoker Manufacturers' Association, the American Civic Association, and the Fuels Division of the American Society of Mechanical Engineers.

The ordinance regulates the emission of smoke from any chimney, smoke-stack or other source within the corporate limits of the city, creates a Bureau of Smoke Regulation and prescribes penalties for the violation of provisions of the ordinance. To quote in part:

Section 3. The production or emission within the city of smoke, the density or shade of which is equal to or greater than number three (3) of the Ringlemann Chart, from any stack, except that of a locomotive or steamboat, for a period or for periods aggregating two (2) minutes or more in any period of fifteen (15) minutes, and the emission of such smoke from any locomotive or steamboat for a period or for periods aggregating one (1) minute or more in any period of eight (8) minutes, is hereby prohibited.

Section 5. It shall be unlawful for any engineer, contractor, or other person or corporation to do the work of constructing, installing, reconstructing, altering or repairing any furnace, boiler furnace, stack or other apparatus connected with stack, unless the person or corporation for whom such construction, installation, reconstruction, alteration or repair is being made has proper authority, in the form of a permit from the Bureau of Smoke Regulation for such work.

Section 10 (a). Each power boiler with more than 1,500 square feet of heating surface, using coal as fuel, shall be provided with a mechanical stoker or other device or attachment approved by the Bureau of Smoke Regulation.

Section 10 contains 26 paragraphs specifying kinds and sizes of boilers, furnaces, stacks and other equipment, and methods of installation required.

The complete ordinance appears in the May issue of *Mechanical Engineering*, published by the American Society of Mechanical Engineers, 29 West 39th Street, New York. The committee which drafted the ordinance is desirous of obtaining helpful criticisms and suggestions. These should be mailed to the Chairman, Dr. O. P. Hood, Bureau of Mines, Washington, D. C.

Tax-exempt Securities Favored by Organized Labor

THAT organized labor is not worrying about the alleged injustice of allowing persons of wealth to escape taxation by investments in tax-exempt securities, was made clear on April 15 in an address by Peter J. Brady, President of the Federation Bank of New York, a member of the Federal Reserve System. Speaking before the Academy of Political Science, as Chairman of the Committee on Banking and Education of the New York State Federation of Labor, Mr. Brady said, in part:

"Labor's plan of taxation when it becomes definitely formulated will be as constructive as its economic policy, which is based upon the gradual raising of the standard of living of the American wage-earners. Trade unionists observe with great satisfaction our present sound economic condition, our wholesome retail trade and the abundance of savings available for reinvestment in industry and commerce as the best vindication of their traditional belief that fair wages and a high living standard are the foundation of our national well-being.

"Labor is better off than ever before, in spite of the tax rate and a war debt twenty times greater than the national debt previous to 1914. Wages measured by the commodities that can be bought are at the peak both for skilled and unskilled labor, with the exception of certain unorganized industries employing women and children, and the 'white collar group' of teachers, clergymen, office and technical workers.

"Secretary Mellon has declared that much wealth has evaded the surtax by being invested in tax-exempt securities. If that is the direction wealth is taking flight to, let it, for such investments are for the common good. It has been suggested that it is quite impossible for wealth to monopolize these securities and that fully three billion dollars of the available eleven billion of such bonds are held by small property owners. Among the corporations holding such securities are banks, including labor banks representing the cooperative ownership of many persons of small means. Rather than to restrict, we welcome the expansion of this form of investment and the necessary construction of public schools, hospitals, state roads, canals, water and electric power works, and similar enterprises for the common good."

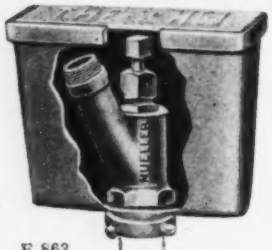
Progress in Removal of Objectionable Bill-Boards

IN conformity with its pledge* to the National Committee for Restriction of Outdoor Advertising, the Standard Oil Company of New York has begun the removal of its advertising signs where they mar or obstruct natural scenic beauties. The following statement by the company's president, Herbert L. Pratt, was read at a meeting of the National Committee last month by the committee's chairman, Mrs. W. L. Lawton, of Glens Falls, N. Y.

"As an example of the procedure we intend to follow, I will cite the first instance which has just been completed. Some ten days ago I received a note from the Secretary of the Chamber of Commerce of Great Barrington, Mass., telling me of having read in the newspapers of what we proposed to do with objectionable sign-boards. He said there was one of our boards on the main highway between Great Barrington and Stockbridge which was obstructing a beautiful view of the scenery and was the only bill-board of its kind in that location.

"On receipt of his letter I immediately had one of our representatives, with a representative of the Thomas Cusack Company, from which we rent the board and which is showing a ready willingness to help us in this matter, call on the

* See THE AMERICAN CITY for April, 1924, page 433.



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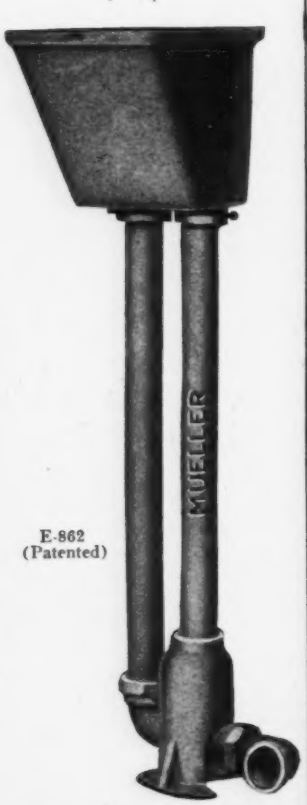

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For Public Places, Parks and Golf Links

This Mueller device takes the place of the old style, sloppy hydrant. No. E-862 is designed for outdoor use, and has the valve sunk below the frost line, thus making special packing to prevent freezing unnecessary. No. E-863 is designed for use indoors, or in southern latitudes, where there is no danger from frost, and it is consequently made without a stop and waste device.

MUELLER

Sprinkling and Flushing Hydrant

closes flush with the ground or floor, which does away with the unsightly goose neck, as well as eliminating the obstruction to lawn mower or truck. The construction provides for the disposal of water through the bottom of the box, thus minimizing the possibility of freezing, due to the formation of puddles.

The Mueller representatives at the A.W.W.A. Convention at the Hotel Astor, New York, May 19-24, will be glad to give you details and to quote you prices.

Mueller Co., Decatur, Ill.
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145-149 W 30th St., New York;
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Chamber of Commerce and say that the board would be moved and placed in any location which the Chamber itself might select.

"Again, by the same mail I received a letter from the Chamber of Commerce of Lawrence, Mass., saying that if we would send them the designs our architects were preparing to replace the unsightly signs displayed on the 'hot dog' and soft drink booth along the highways, they would be glad to distribute these among those persons who were selling such commodities along their roadsides, in the effort to improve the general appearance of their highways. It is our purpose to send these as soon as they are prepared.

"Whenever possible, we will have our signs which are objectionable or which mar the scenic beauty of the country removed before our contracts expire."

Among the large advertisers who are reported to have endorsed the movement recently are the Gulf Refining Company, Dodge Brothers, the Ajax Rubber Company, the Hood Rubber Company, the Ward Baking Company, the Texas Company and the Fleischmann Company.

A Tribute to the Late Nelson P. Lewis

To the Editor of THE AMERICAN CITY:

To many of the readers of THE AMERICAN CITY the announcement of the death of Nelson P. Lewis will come as a shock and will be received with a sense of personal loss, for he was known from the Atlantic to the Pacific. Many of those who did not know him personally are familiar with his writings.

There are few engineers who have rendered such long and distinguished service to the cause of city planning as Nelson P. Lewis. For about thirty years he was connected with the government of the city of New York, first in the city of Brooklyn before the consolidation of Brooklyn and New York, and later as Chief Engineer of the Board of Estimate and Apportionment of the Greater City. Much of the physical development of the city is due to his planning or to his counsel and advice. Mr. Lewis was not only a good engineer; he was a student and a traveler and an artist. He knew the best work of the past in Europe and America and he kept pace with the best work of the present. He was a good teacher. No one could hear him lecture and hear his comments on the pictures that he showed without being informed and charmed. He had powers of persuasion so that one naturally wished to accept his view.

There are men in this world who have ample knowledge and excellent judgment, but who are almost wasted because no one wants to agree with them. Lewis was of just the opposite type. He had the judgment and he had the knowledge, and he could make all his judgment and knowledge effective. There are not many men who serve the city of New York for a great many years in important place, and the fact that they do so serve is of itself a testimonial to their fine qualities of head and heart both.

Mr. Lewis made a contribution to city planning by the publication in 1916 of his book entitled "The Planning of the Modern City." This was the first American book on city planning written by an engineer for engineers. While Mr. Lewis may have had engineers in mind first, this book has been very useful to the architects and landscape architects from whose ranks most of the other books on city planning have come. It appeals also to laymen who are interested in city planning and who want instruction concerning what city planning has done, what it is, and what it ought to do. In his chapter on the opportunities and responsibilities of the municipal engineer, Mr. Lewis said:

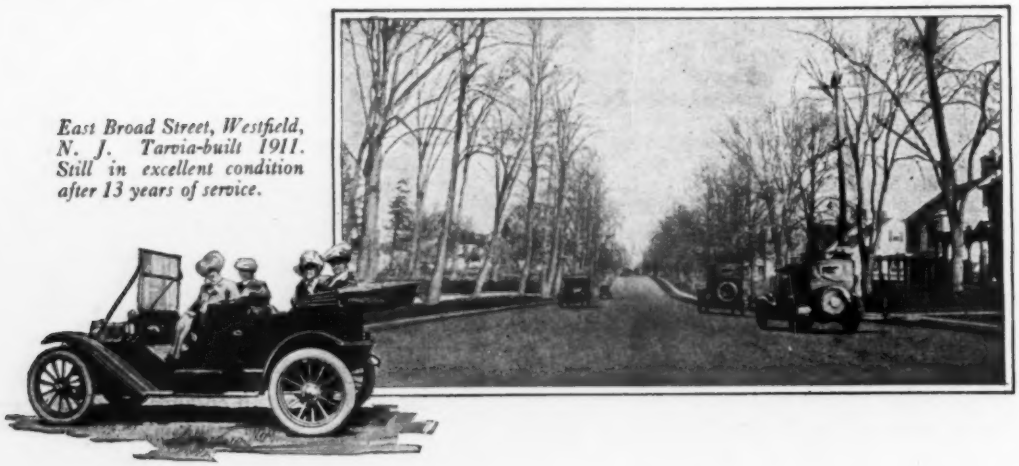
"The engineer as the first man on the ground has a rare opportunity and a grave responsibility. The task calls for vision and imagination, and these are qualities the exercise of which on the part of the engineer has often been thought rather dangerous; and yet the engineer lays the foundation on which our cities are built. He has been too prone to regard his preliminary work as a mere matter of surveying; more or less precise surveying, it may be, but he has been more intent upon the accuracy of his measurements of lines and angles and of his computations of areas than upon the larger problems of providing for the orderly and sightly development of the city."

Mr. Lewis had the vision and he was capable of imparting it to others.

When Mr. Lewis retired from the service of the city he became the Director of the Engineering Division of the Committee on Regional Plan of New York and Its Environs. The committee is dealing with a territory of about five thousand square miles situated in three states. Mr. Lewis had traveled this area back and forth and knew it as probably no other one man knew it. He knew its topography, he knew what man had done to it, and he knew the kind of people who lived in it. He was welcome in every one of the towns and villages. He cannot be replaced. There is no other Lewis, but the work will go on, and go on all the better because its foundation was laid as it was.

LAWSON PURDY.

New York, April 16, 1924.



East Broad Street, Westfield, N. J. Tarvia-built 1911. Still in excellent condition after 13 years of service.

This car—long since scrapped! This street—still in perfect condition!

OIL lamps! Braced wind-shield! Open front seat — top neatly folded back so that one got plenty of dust! Can you resist a reminiscent smile at the car of our picture?

That was a smart car as it chugged down East Broad Street in Westfield, N. J., thirteen years ago. But time brings many changes. That car is junk long since.

But not East Broad Street. Unaffected by thirteen years of grinding traffic—it is still in perfect condition, a thoroughly satisfactory street today.

Tarvia streets can be maintained at little cost — only economical maintenance is needed to make a Tarvia pavement last indefinitely.

Now add these points:

A Tarvia pavement will not wave, roll or rut.

A Tarvia pavement will remain skid-proof because of its granular surface.

Thousands of Tarvia streets and roads have proved to taxpayers that—

For the money spent—Tarvia gives more miles and the most years of satisfactory highway service.

Every paving requirement—construction, repair or maintenance—can be met with Tarvia.

Tarvia
For Road Construction Repair and Maintenance

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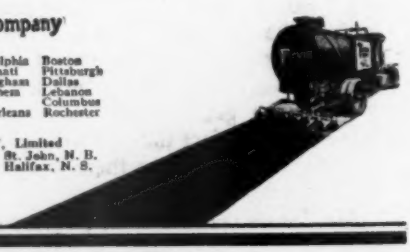

Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway), and from other sources

For further information, Mr. Williams may be addressed in care of
THE AMERICAN CITY MAGAZINE, 443 Fourth Avenue, New York

Recent Zoning Ordinances and Enabling Acts

NEW JERSEY.—Enabling act for municipalities, March, 1924

NEW YORK.—East Rockaway, ordinance, January 10, 1924

SOUTH CAROLINA.—General enabling act, March, 1924

Recent Zoning Decisions

CALIFORNIA.—Miller v. Board of Public Works of City of Los Angeles. The decision of this case in the District Court of Appeals was noted in our March "Notes." A hearing has been granted in the case by the Supreme Court of the state.

NEW YORK.—Matter of Heppe, Supreme Court, Special Term, Part I; reported in *New York Law Journal*, March 14, page 2138. Under the New York City law the petitioner, after application to the Fire Commissioner for a permit, and refusal by him to grant it, has no recourse but appeal to the Board of Standards and Appeals. Mandamus will not lie.

Municipal Gas Co. v. Nolan, Superintendent of Bureau of Buildings, City of Albany. The decision in this case, mentioned in our March "Notes," has been unanimously affirmed in the Appellate Division.

People ex rel. Bruckner v. Walsh et al., Supreme Court, Special Term, Part I, reported in New York Law Journal, March 14, 1924, p. 2138. Under the zoning regulations for New York City the Board of Appeals may "permit in a business district the erection or extension of a garage . . . in any portion of a street between two intersecting streets in which portion there exists a garage for more than five motor vehicles . . . at the time of the passage of this resolution." *Held* that a garage for which a permit had been issued prior to the passage of the zoning resolution, and which was erected, pursuant thereto, after its passage, was an existing garage within the meaning of the portion of the zoning resolution in question.

People ex rel. Neinstein v. Walsh, in accord.

City of Utica v. Hanna, 202 App. Div. 610; affirmed without opinion, 237 N. Y. 26. There is no longer question about the power of the Legislature to authorize the adoption of general zoning ordinances in cities; but under the empowering act contained in the General City Law a zoning ordinance is invalid and not within the power delegated by subd. 25 of Sec. 20 of that law which applies only to a small part of a single street in a city, nor is such an ordinance adopted "in accord with a well-considered plan" for zoning the city, as required by the law.

A zoning ordinance is invalid which permits the construction of the prohibited buildings with the consent of the property owners fronting on the street within a specified distance of the proposed construction. In this connection the Court says:

"Such exceptions would manifestly be inconsistent with enforcement of any adopted plan which the city was carrying out. The clause allowing such exceptions amounts to a delegation by the municipal authorities to the property owners of the power to exempt themselves from the regulations determined under legislative sanction by the city authorities to be beneficial to the welfare of the city. The property owners within any restricted area are not the persons solely or even principally to be considered. The general welfare of the municipality as a whole must be considered."

Nor is the ordinance to be sustained under Sections 19 or 20 of the General City Law (the so-called "Home Rule Act" of 1913).

PENNSYLVANIA.—In re permit to American Reduction Co., Court of Common Pleas, Allegheny County, January Term, 1924. Appeal from a decision of the Board of Appeals of Pittsburgh directing the Superintendent of Building Inspection to issue a permit to the American Reduction Company to erect and operate an incinerating plant in a light industrial district. The law gives the Board the power to vary the ordinance in harmony with its general purpose and in accordance with rules therein contained. The ordinance authorizes the erection of an incinerating plant in a light industrial district only with the permission of the Board of Appeals.

Held that (1) the zoning law and ordinance are constitutional; (2) the provision of the law giving the Board of Appeals power to vary the ordinance is valid. It is not a delegation of legislative power, but a provision with regard to the power of an administrative body, which is to ascertain facts and apply them to certain requirements; (3) the decision of the board granting its permit with suitable conditions is, under the circumstances of this case, a reasonable one. The decision of the Board allowing the erection of the plant in the light industrial district is therefore sustained. If the plant, notwithstanding the regulations imposed by the Board, becomes a nuisance, those affected may always apply for appropriate relief.

The New Zoning Law for New Jersey.—The enactment of the new zoning Law for New Jersey, applicable to all the municipalities of the state, is a zoning event of importance. Previous to the passage of this law the zoning enabling statutes of New Jersey were numerous and, to say the least, confusing. In the opinion of many students of the subject, these laws were also, in many important respects, defective. The new law is in general conformity to the model law of the Department of Commerce, Washington, D. C.

Report on Zoning in Cincinnati.—The United

For— ROAD BUILDING *and* MAINTENANCE

"Our Bests are used for all kinds of road building and road maintenance as well as rock crushing," a road superintendent writes. "I find that they will do any job that we have, and *we save money by using them in place of horses* to do all kinds of road work. We have two 'Thirties and two 'Sixties.'"

It will pay YOU to investigate the advantages of Best Tractors. Send for a list of nearby owners and let their testimony—man to man—convince you.

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BEST TRACTORS

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City Planning Committee of Cincinnati on January 24 issued to the City Council an excellent 60-page pamphlet consisting of a "Statement and Evidence Submitted on Pending Zoning Ordinances"; explaining the ordinances from the many points of view from which they should be considered, and giving statements of opinions from experts on city life and growth. The pamphlet ends with a statement by Alfred Bettman on the constitutionality of zoning, which is especially timely and helpful.

Conference on Zoning as Affecting Telephone Companies.—The Association of City Planning Commissions of Cities of the Third Class in Pennsylvania has issued a report of the conference of zoning commissioners, city planning commissioners and municipal officials held at the invitation of The Bell Telephone Company of Pennsylvania at Philadelphia on December 14, 1923. This bulletin may be obtained from Leo J. Buettner, Secretary of the Association, Johnstown, Pa.

The Municipal Bond Market

By Sanders Shanks, Jr.
Editor, *The Bond Buyer*

Governor Smith Helps Southern Cities

THE adoption of the "Southern cities" savings bank investment amendment by the New York Legislature has removed a long-standing injustice in the municipal bond market. The New York law has always excluded as savings bank and trust fund investments bonds of cities located in states which since 1861 have defaulted upon the state debt. As most of the Southern States defaulted temporarily during the Civil War on bonds held in the North, this provision has stood as a bar against the bonds of some of the best cities in the South, including Richmond, which, we believe, has never in its history defaulted or delayed the payment of its own debt. This sectional discrimination has always grated on the sensibilities of the South and has also very materially affected the market price and amount realized by the cities in selling their bonds. It is of interest to all city officials to know that the eligibility of their bonds as investments for New York savings banks has an effect on their credit which is roughly estimated at 1/10 per cent in the net interest rate paid on their bonds. On $1,000,000 bonds of an average maturity of fifteen years, this means about $10,000. In other words, the Southern cities have for many years lost at least $10 a thousand on their bonds because of the discrimination in the New York law.

Former efforts to remove this discrimination have been unavailing, a bill for this purpose initiated by the Tennessee cities having failed in 1923. The present successful effort originated with the city of Richmond. It was made by the city's bond counsel, Reed, Dougherty & Hoyt, and was successful because of the active interest and support of Governor Smith. The city secured the interest of Governor Trinkle of Virginia and of other state and city officials of the South and members of Congress, including ex-Governor Montague of Virginia and Cordell Hull of Tennessee. Governor Smith not only responded generously to this appeal, but he grasped its larger aspects and insisted on removing an unfriendly discrimination against sister states based, as it was in most instances, on the fact of their secession during the Civil War. It is gratifying to know that at last that war is over so far as the credit of the Southern cities is concerned.

An Important Bond Sale

The largest and most interesting bond sale of the year was the New York State $45,000,000 Soldiers' Bonus sold last month. The bonds bear interest at the rate of 4¼ per cent and were sold for a premium of $659,565, making the net interest cost to the state 4.09 per cent. The premium received by the state will be sufficient to cover the cost of the distribution of the bonus. The bidding for the issue was very keen, five banking syndicates having submitted competitive bids. A few days after the bonds had been awarded, the successful syndicate announced that the entire issue had been resold at prices to yield the investor 4 per cent.

The close bidding for this issue and other large issues listed below, indicates that bond dealers are optimistic about the future:

IMPORTANT STATE AND MUNICIPAL BONDS SOLD IN APRIL

Amount	Municipality	Maturity	Coupon Rate (%)	Net Yield (%)
$45,000,000	New York State	1925-44	4¼	4.09
3,300,000	Kansas City, Mo.	1942	4½	4.37
5,000,000	St. Louis, Mo.	1929-44	4½	4.37
3,299,000	Hudson County, N. J.	1925-72	4½	4.48
5,000,000	Chicago, Sanitary District, Ill.	1926-44	4	4.50
1,511,500	Passaic, N. J.	1925-64	4¾	4.52
2,285,000	Hawaii	1954 opt. 1944	4½	4.56
1,000,000	New Orleans, La.	1926-35	4½	4.90

Warford the Road Builder

"We cannot speak too highly of the Warford Transmission, for we feel that it is really the making of the Ford Truck."
John C. McCusick,
McCusick Contracting Co., Minneapolis

Warford, the selective type transmission for Ford Cars and Trucks, proved in the gruelling test of road building, has made the Ford Truck the favorite of highway contractors throughout the county.

Conspicuous service at road building, the toughest job of them all, is being given by Warford equipped Fords over the breath-taking grades of Colorado, the plains of Iowa and in the fickle climate of Michigan where the contractor gambles with the weather. The speed that Warford gives the Ford insures his profit.

Letters from the Michigan camps, in the very heart of the automotive industry where the newest wrinkles in car and truck engineering are brought forth and tested, are unanimous in praise of the added pulling power, added speed and greater economy of operation and maintenance that the Warford Transmission has given the Ford Truck. These letters stand confirmed by repeat orders.

With Warford, the Ford Truck pulls a full two tons through the roughest going. It won't stall in the subgrade. It is guaranteed to pull this double load wherever there is traction. On hard roads Warford makes your Ford a speed truck.

Warford gives you this double duty unit at one third the cost of any other two-ton or speed truck. Ask your Ford dealer or write us.

Warford
AUXILIARY TRANSMISSION

The Warford Corporation - - 44 Whitehall St., New York

The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

Restriction by City Government on Freedom of Speech

"THE right of free speech and right of assembly are not absolute, and under the ordinance the mayor had the power, and it was his duty to withhold permits for street meetings when he thought that such meetings would interfere with travel or create disorder. . . . But the people are not to be lawfully deprived of their free customs and privileges by the mere will of the magistrate. Street speaking is not forbidden to all, but only to those who have not received permission from the mayor. The presumption is that all discretionary power will not be arbitrarily exercised, but when it is so exercised the Supreme Court of the United States has not hesitated to hold that it will protect the individuals thus oppressed." This statement made by Mr. Justice Pound of the New York Court of Appeals in his dissenting opinion in the case of People vs. Atwell, 133 Northeastern Reporter, 364, fairly expresses a judicial view which has been frequently expressed.

In the cited case, the majority opinion sustained a conviction of violating an ordinance of the city of Mt. Vernon, forbidding "the holding of public meetings upon the public streets of the city," etc., "without special permit of the mayor, to be granted in writing." Holding that the ordinance constituted proper exercise of charter power to regulate the use of streets, the opinion said:

"It is not repugnant to the state or Federal Constitution, since it does not abridge the right of free speech or assemblage. Public streets are primarily for public travel. . . . Any obstruction on the streets, whether permanent or temporary, may be declared unlawful.

"It is quite beside the question to assert that the acts forbidden may be lawful in themselves, and could not in a general way be prohibited. On the streets the exercise of such rights is subordinate to the public right of travel and may be regulated or prohibited. Public meetings and asemblages held on the streets tend to obstruct the streets and destroy in a measure the very purpose for which they have been dedicated. It is too well settled by judicial decisions in both the state and Federal courts that a municipality may pass an ordinance making it unlawful to hold public meetings upon the public streets without a permit therefor to require discussion. . . .

"The people have many constitutional rights, the exercise of which on the public streets may be prohibited."

Supporting its views, the Court cited similar decisions of the highest courts of Massachusetts, Georgia and Michigan.

In the case of Duquesne vs. Fincke, 112 Atlantic Reporter, 130, the Pennsylvania Supreme Court sustained the validity of a similar ordinance, observing—in response to a contention that such measures violate the clauses of the Bill of Rights which guarantee to citizens the right of free speech and the right to apply to those invested with the powers of government for redress of grievances, etc.—that the contention overlooked that the clauses do not give one "the right to assemble with others and to speak wherever he and they choose to go. He would hardly admit that others would have the right so to do in his house without his consent; and doubtless would concede the same to all other citizens. If he wishes to address an assemblage he must gather his audience together in places where he and they have the right to be for this purpose; and the streets are not such places, since they are intended for passage, and not for assemblage."

In several of the decisions on this subject, including the New York case, the existence of statutory or charter authority for the adoption of such ordinances appears to have been a vital factor in the conclusions reached. And in the case of Anderson vs. Tedford, 85 Southern Reporter, 673, the Florida Supreme Court decided that an ordinance forbidding street meetings without official permission was void for unreasonableness. The Court remarked:

"This discretion. . . . is uncontrolled by

Detroit United Railway Uses Fords for Track Maintenance

"In the repair and maintenance of our interurban lines running to Flint, Pontiac, Port Huron, Jackson, Toledo and other points, we use six Ford One-Ton Trucks for hauling poles, sand, gravel, ties and wiring supplies," says A. L. Louks, of the motor transportation department, of the D. U. R.

"The traveling public demands uninterrupted service which at times necessitates quick work by the track department to keep our lines open.

"When such emergency arises we can depend on our Fords to get men and materials on the job quickly.

"In spite of the severe usage these trucks receive, often being heavily loaded and driven over rough roads, they stand up surprisingly well, requiring very little attention for adjustments or repairs."

Throughout the country in countless cities and towns Ford Trucks are saving private corporations and taxpayers many thousands of dollars every year. The inexpensive operating and maintenance costs, together with the satisfactory performance of Ford equipment, prove the advantage of Fordizing municipal and Public Service departments.

Any Authorized Ford Dealer has facts and figures that will show you how you can profitably Fordize your business.

One-Ton Truck Chassis, $370 F. O. B. Detroit

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any definite and reasonable terms upon which the permit may be granted. Those officials are empowered to grant or withhold permission . . . . without inquiring into the character of persons applying for permit, the purpose of the meeting or assembly, or its effect upon the business, traffic, or peace and quiet of the city; but may, for reasons entirely personal, grant permission to any person and withhold it from another, and as the religious or political proclivities of the head of the city administration change, he may grant permission to a representative of one sect and deny it to another, and withhold permission from a person of one faction and grant it to another of different persuasion. . . .

"The ordinance. . . . does not fix and determine the conditions applicable alike to all applicants under which meetings may be lawfully held. . . . Such an ordinance is unreasonable and void."

And in the case of Bloomington vs. Richardson, 38 Illinois Appellate Court Reports, 60, one of the intermediate appellate courts of Illinois ruled that an ordinance providing that "no public gathering or meeting of any kind for any purpose. . . . tending to the obstruction thereof, or the gathering of a crowd of people thereon, shall be permitted upon the public streets or public grounds of said city except a written permit therefor be first obtained from the mayor," was unreasonable and void, if interpreted to apply to all meetings or gatherings of any kind or for any purpose upon the streets and other public grounds of the city.

The principal point of conflict in two lines of decisions appears to be this: The majority of the courts, following the view adopted by the New York Court of Appeals, hold that an ordinance of the general character here discussed is not void because discretion is vested in the municipal authorities to determine what meetings shall be permitted and what shall not be. Redress will be granted against an unreasonable and arbitrary exercise of the discretion, but it will not be presumed that there will be such abuse of discretion. The minority view, expressed by the Florida court, is that the ordinance is void if it does not lay down some basis for controlling within reasonable bounds exercise of the official discretion. Offhand, it is difficult, if not impossible, to outline such basis in language appropriate to an ordinance, and our attention has not been drawn to an ordinance in which it has been attempted to define the terms on which permit is to be granted or denied.

Sundry Items of Municipal Law

Power of Cities to Impose Occupational Taxes

Discussion in Toledo of the feasibility of imposing occupational taxes to supply needed revenue draws attention to legal aspects of municipal power to provide for such taxes.

It seems to be generally understood that municipalities do not have inherent power to levy occupation taxes; that cities not operating under home rule charters must look to authority from the Legislature. But the *Toledo City Journal*, in a recent issue, plausibly assumes that "inasmuch as the General Assembly has not limited the authority of the municipality to levy an occupational tax, it would follow . . . that each home rule Ohio municipality has the right to impose an occupational tax."

It is noted, in this connection, that a few years ago the Supreme Court of Ohio said, in upholding the right of the city of Cincinnati to impose taxes of this kind, by reason of its right of local self-government in taxation as well as other matters:

"It is our conclusion that an ordinance of that character is a valid exercise of its legislative power, and unless and until the state itself invades the field, or expressly interdicts the exercise of the power, the authority of the city of Cincinnati to utilize such subjects of taxation must be upheld."

It is to be inferred, however, from the discussion in Ohio that it is there regarded that an occupation tax measure can be justified better on a ground of temporary need than as a permanent source of revenue, considering the fact that it creates a burden in addition to general taxes.

Power of City Councils to Vacate Alleys and Streets for Private Benefit

What the Illinois Supreme Court lately observed in the case of Wolbach vs. Rubens, 138 Northeastern Reporter, 521, concerning the right of a city to vacate a street or alley appears to be in line with what the courts of other states generally hold on the subject:

"The law is definitely established in this state that cities hold title to the streets and alleys for the use of the local and general public, and in trust for such use, and none other, and they cannot lawfully vacate a street or an alley, or a portion of either, for the benefit and use of a private person or corporation. The authority delegated by law to the cities is to lay out, establish, open, alter, or vacate streets and alleys, and to regulate the use of the same, and in exercising this authority the public interest only must be considered. . . . On the other hand, the courts have no right to inquire into the motives of a legislative body nor into the wisdom or expediency of legislative acts. . . . It is presumed that public officials act

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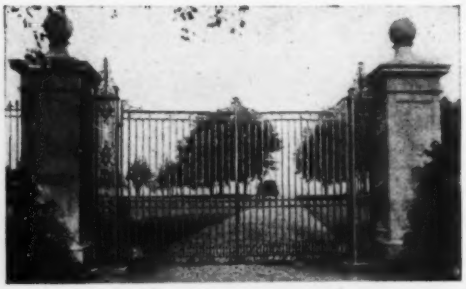

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honestly and patriotically and discharge their duty to the public. . . . Because some private interest may be served by the vacation does not render a vacation ordinance void. Before such an ordinance is void it must clearly appear that no consideration of public interest could have led to its enactment."

Street Lighting as a Public Purpose Supporting General Taxation

Applying provisions of the Utah statutes, the Supreme Court of that state has decided that a city is empowered to light streets by drawing on the general revenues of the city, although the lighting may be limited to a given district. (Wicks vs. Salt Lake City, 208 Pacific Reporter, 538.) It is further held that creation of a lighting district, with provision for special assessments to defray the expense, did not preclude the city from establishing a guaranty fund to secure payment of the bonds issued to defray the expense of the improvement. In part, the opinion of the Court reads:

"The assumption of plaintiff that the proposed improvement was not for a public purpose flies in the face of an obvious truth. The primary purpose of lighting a street is to afford comfort, safety, and convenience to those who use the street, without regard to whether or not they own property in the lighted district. This is certainly a public purpose. The enhancement of the value of abutting property is merely incidental to the main purpose."

Building Permit May Be Rescinded Before Being Acted Upon by the Licensee

Under circumstances mentioned in the following excerpt from the opinion of the Iowa Supreme Court in the case of City of Des Moines vs. Manhattan Oil Co., 184 Northwestern Reporter, 823, it was held that a permit to establish a gasoline filling station was subject to revocation:

"We are disposed to hold that the adoption of the resolution to grant the building permit did not have the effect to confer upon the propesty owner or his lessees a vested right which could not be canceled or recalled, under the circumstances here shown. The lessor had not yet acquired title to the property, and did not acquire it until after the permit had been rescinded. The proposed filling station had not been deposited there. When the application for permit was made, there was then pending and undisposed of before the council, as the applicant well knew, the petition of the property owners within this area to make it a restricted residence district, and if the Council, having adopted the resolution to grant the permit under such circumstances, concluded it had acted inadvertently or improvidently, or without proper regard for the rights of the petitioners for a restricted district, rescinded the resolution with reasonable promptness, we are of the opinion it did not exceed its authority or abuse its discretion.

City to Avoid Flood Danger May, Without Compensation to Abutting Owners, Make Reasonable Regulations Relative to Building Lines Along a Stream, But Cannot Thereafter Re-locate Line to Detriment of Owners on One Side and in Favor of Owners on the Other

A city, authorized by its charter to make proper regulations for guarding against danger or damage from fire, water, or other element, and to regulate the construction of buildings, may, as a proper exercise of its police power, adopt reasonable restrictions for buildings upon lands along a stream flowing through the city so as to avoid danger from floods. To that end it may adopt an ordinance fixing building lines on each side of the stream, beyond which it may prevent the owners of lands bordering thereon from constructing their buildings, even though their title extends to the middle of the stream. And if the restriction be reasonable, a riparian owner is not entitled to compensation for that portion of his land which he is thus forbidden to use.

Where the city has adopted an ordinance fixing the middle of the stream as a base line and building lines on either side at a distance of 30 feet therefrom so as to keep the stream unobstructed at a width of 60 feet, and this width is found to be sufficient, it cannot thereafter, by permitting the riparian owners on one side of the stream to encroach upon and obstruct the stream on that side, under the guise of its police power, adopt an ordinance relocating the building line on the other side so as to maintain the width of 60 feet and by injunction prevent the owner of land on that other side from building upon the line as originally established. To deprive him of the use of the additional land, it must make compensation to him. (West Virginia Supreme Court of Appeals, City of Welch vs. Mitchell, 121 Southeastern Reporter, 165.)

Second European Summer School in Landscape Architecture

Special emphasis will be placed on town planning in the itinerary of the second European Summer School of Landscape Architecture, to be conducted under the direction of P. H. Elwood, Jr., Professor of Landscape Architecture, Iowa State College. To enrich the background and broaden the outlook of students and graduates of the fine arts is the object of this European Summer School. The party will sail from New York on June 17 and return via Montreal September 14. Full particulars can be secured by addressing Professor Elwood at Ames, Iowa.

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Plans for Neris les Bains, France 71.31 (44.57)

Indicating the spread of the idea of more intelligent town planning for small, as well as large, communities in France, it is to be noted that under the trained guidance of a Paris Urbanist the very ancient little town of Neris les Bains, near Montluçon, in the Department of Allier, is planning for its future growth. This is primarily a health resort with no important industry. The town is very ancient, there being many indications of its importance in Roman times and of the fact that the beneficent influences of its thermal springs were recognized long before this in the Celtic epoch. The town has been three times devastated—by the Huns, the Goths, and the Normans. It is not at present on a railroad line, but it is expected that one will soon be built, stimulating more rapid growth. In anticipation of this, in spite of present limited means, plans for new developments and improvements are being made. These include better facilities at the bathing establishment, the creation of promenades and open parked spaces for the bathers and visitors, and the improvement and extension of highways. All this is to be done with the utmost respect for the character of the older, narrower streets and their very ancient houses. I. No. 324

Garden Cities, France 71.313 (44.382)

At Pierrepont, in the Department of Meurthe and Moselle, the Manufacturing Association, "Glorieux," has recently built a garden city. This is located on a low hill in a wooded district. For the benefit of employees having large families, 150 houses have been built, each with nine rooms. Each has an ample garden adapted to horticultural developments, which are encouraged by means of prizes. The Association has constructed schools for boys and girls, a building for shower-baths, a dispensary and a cooperative store. The provision for large families and the low rents—never higher than four francs per room per month—have served to increase the comfort of all. I. No. 326

Groups of Houses ("Complexes") in Holland 71.43 (492)

It is sometimes difficult to define the particular character of a town, but that of Haarlem, in Holland, has been very definitely established by the Dutch writer, Van Deyssel, in his "Chats about Haarlem" ("Causerie van Haarlem"). A cooperative building society in this Dutch city, known as "On der Dak," has recently built a group of 52 houses; and, thanks to their architect, Rodenburgh, the very definite and peculiar characteristics of the town so well established have been respected in the new buildings and their grouping along Kleverlaan (Avenue Klever). I. No. 328

Inexpensive Housing in France 33.332 (44)

The Société Française des Habitations à Bon Marché has recently published its report to the President of the French Republic for the year 1923. This very important document, prepared by the well-known French housing and town planning expert, Georges Risler, reviews a number of questions, including changes in legislation in regard to housing problems in France and other countries. In France he notes as important the resumption of activity on the part of the Societies for Inexpensive Homes, the total sum advanced to these organizations having been 3½ times greater in 1922 than in 1921. For the Cooperative Societies the corresponding total has increased tenfold. Numerous projects completed or proposed by the Public Building Department are set forth in detail. The report analyses the work of the Federation of Building Societies; the present situation of the Rothschild, Lebaudy and other foundations; the Building and Loan Societies; and several private initiatives, such as those at Rheims and other garden cities in Northern France. II. No. 451

Healthful Housing Conditions, Glasgow, Scotland 61.438.3 (41.43)

The City Council of Glasgow has decided to demolish a slum district of particularly miserable character and to rebuild new houses for the occupants. An interesting feature of the rearrangements is that iron beds will be installed, for it has been noted that wooden beds furnished for workmen's houses by the city of Amsterdam were burned by some of the tenants during a shortage of firewood. II. No. 459

Strasburg, Alsace, France 61.438.3 (43.445)

This city has, during the past year, undertaken an important step in solving its housing and congested traffic problems. In the heart of the town there was an old fortress surrounded by a slum area of narrow, ill-lighted streets and old houses. To aid in its struggle against such unhealthy conditions and its housing shortage, the city has undertaken what has been called "la grand percée," cutting through this old quarter an important, wide commercial street. In this connection, application has been made of a law that became part of the Civil Code during the German occupation ("Erbbaurecht" or "droit de superfice") granting the right of a form of "emphyteusis"—an agreement in this case extending over a period of 65 years with progressive rates of ground rental—all this with the purpose of encouraging building construction on the high-priced land along the new avenue. New lodgings or apartments have been built by the city or by means of financial support granted by the city to individuals. Besides this, the city cedes land under advantageous conditions in two outlying portions of Strasburg. II. No. 460

EDITORIAL NOTE.—In the *Tablettes Documentaires Municipales*, the publication of the International Union of Cities from which the foregoing items have been translated by Stephen Child, many other articles of municipal and civic interest are abstracted. In the original editon the name of the magazine or report from which each item has been prepared, is shown, together with the date and place of its publication. Readers of THE AMERICAN CITY who desire further information regarding this source of civic documentation can obtain it from Mr. Child at 588 Merchants Exchange Building, San Francisco, Calif.

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Municipal and Civic Publications

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Elements of Water Bacteriology.—By Samuel C. Prescott, Professor, Massachusetts Institute of Technology and C.-E. A. Winslow, Professor, Yale School of Medicine. Fourth edition, rewritten. John Wiley & Sons, Inc., New York. 1924. IX + 211 pp., including bibliography. $2.25.

The fourth edition of this standard work on water bacteriology, the first edition of which was published nearly twenty years ago, is devoted to the work of the practical water bacteriologist. It incorporates all of the available new matter, including the latest recommendations of the Committee on Standard Methods of the American Public Health Association and reduces materially the amount of space devoted to the highly technical isolation seldom employed. The various chapters consider the bacteria in natural waters, the quantitative bacteriological examination of water and its interpretation, a study of the organisms developing at body temperature, the colon group of bacilli and methods for their isolation, significance of the colon group in water, other intestinal bacteria as indices of pollution, the significances and applicability of bacteriological examinations, the bacteriology of sewage and sewage effluent, and the bacteriological examination of shellfish.

Appraisers' and Adjusters' Handbook.—By William Arthur. U. P. C. Book Company, Inc., New York. 1924. XVII + 616 pp. $5.00.

This book is in handy size, measuring 7¼ x 4¼ inches and one inch thick, so that it can be a real handbook for those who are engaged in valuation work. The detailed analyses and tables of data on building costs arranged by individual processes and materials and the discussion of depreciation are truly interesting. They are arranged in such a way that the assessor, the appraiser or the valuation engineer or other evaluating official may make instant use of them. Part I deals largely with general principles, square and cubic foot costs, percentages of the various kinds of work, comparisons and approximate estimating. Part II shows how the detailed costs may be found. The tables are especially compiled for quick reference. This should be a helpful volume for municipal and county officials engaged in appraisal work.

Home Sewage Disposal.—By W. A. Hardenbergh, Sanitary Engineer and Director of Rural Sanitation, Jefferson County Board of Health, Alabama. J. P. Lippincott Company, Philadelphia. 1924. Illustrated. VII + 274 pp. $2.50.

This helpful book has been prepared especially for health officers and health workers in the field, to furnish reliable data to engineers and others engaged or interested in sewage disposal in single homes, small communities and institutions and isolated comfort stations in parks, at beaches, etc. After a general discussion of the need for sanitation and the general principles of sanitation, the book takes up the various methods of disposal, including the pit privy, septic closets, chemical tank closets, the disposal of excreta, small septic tanks and small Imhoff tanks, as well as secondary methods of treatment. This is a book which every small-town health officer and many in the larger communities should have for immediate reference.

The Communicable Diseases.—By Allan J. McLaughlin, M. D., Surgeon, United States Public Health Service. Harper & Brothers, New York. 1923. X + 269 pp. $3.00.

A book designed to educate the great intelligent group which comes between that of the specialists and technicians and the class that can digest only the simple leaflet of "Don'ts." The facts are plainly stated without theoretical discussion. The diseases covered are those usually reportable by law to the health department. The readers to whom this book will appeal are those who will, by word and example, educate those around them.

International Association of Fire Engineers.—Proceedings of the Fifty-First Annual Convention of the Association held at Richmond, Va., October, 1923. 331 pp. (Apply to James J. Mulcahey, Secretary, Yonkers, N. Y.)

Public Health in the United States.—By Harry H. Moore. With an Introduction by Haven Emerson. Harper & Brothers, New York. 1923. XIX + 557 pp. Illustrated. $4.00.

A compact presentation of important facts regarding the nation's health, under a unique classification. Part I is, Man's Concern Through the Ages for His Health. Part II—The Human and Economic Costs of Disease—includes chapters on: What Makes Men Die Before Their Time!; Sicknesses Which Disable; Defects and Minor Ailments; The Economic Costs of Disease. Part III—The Warfare Against Disease—covers: The Conquest of Science; Unconquered Enemies; Enemies Not Yet Attacked. Part IV—The Exploitation of Ignorance Regarding Disease—deals with: Nostrums and Quackery; Health Activities More or Less Misdirected. Part V—The Conquest of Disease by Health—tells of Health Organizations; The School—a Super-Health Organization; Organized Recreation; The Dispensary, the Clinic, and the Health Center; Health Service in Industry; Other Significant Health Activities. Part VI—The Expanding Field of Public Health—embraces Economic and Sociological Aspects of Public Health; The Socialization of Preventive and Curative Medicine; The Problem of Personnel; Public Economy and Public Health; Prospects of a Forward Movement. The appendices contain much valuable material.

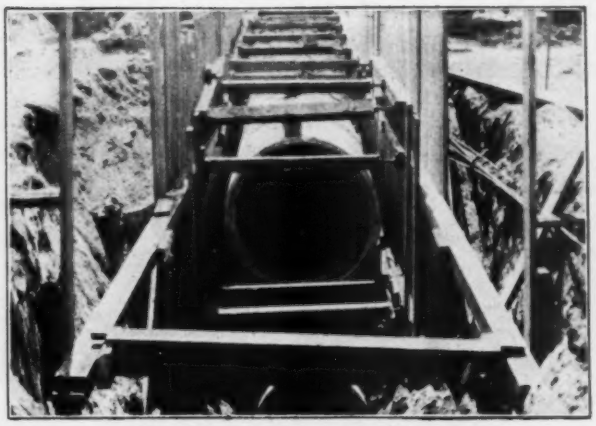
Our City—New York.—By the High School Students of New York City, under the supervision of Frank A. Rexford. Allyn and Bacon, Boston. 1924. XXV + 400 pp. Many illustrations. $1.20.

Hundreds of high school students took part in the preparation of this book. The best work on the book in each of nineteen schools developed into a chapter. Great assistance has been given to the schools in the study of civics, by city departments, bureaus, civic organizations and individuals. This volume was produced in 1923 as part of a survey of the work of the public schools of New York City. It covers: water-supply, food protection; regulation of buildings; waste disposal; regulation of work; provision for recreation; guarding the health; welfare of the unfortunate; protection of life and property; city planning; communication and transportation; lighting and heating; making and executing laws; courts; correction of delinquency; finance; voting; education.

The Hoboken City Hall.—Issued frequently by the Bureau of Municipal Research, Chamber of Commerce, Hoboken, N. J. 4 pp. Handy size. The issue of April 7, 1924, states the purpose of the bulletin—to "treat of the different matters having to do with the administration of the affairs of the city of Hoboken"; and deals with the revised miscellaneous revenue rates embodied in a series of ordinances introduced by the Board of Commissioners on April 7; and also with the exemption from municipal taxation of the Shipping Board piers. (Apply to the Bureau.)

Better Homes in America.—Why and How to Teach Civic Effectiveness, as Illustrated by School Participation in the Community Better Homes Campaign. By Elizabeth Carlisle, Head of Civics Department, Washington Junior High School, Port Huron, Mich. Foreword by James Ford, Executive Director, Better Homes in America. Publication No. 2, March, 1924, of Better Homes in America, National Headquarters, 1653 Pennsylvania Avenue, Washington, D. C. Describing the most significant of the local home demonstrations—that in Port Huron, Mich., under the direction of the author of this pamphlet. (Apply to the National Headquarters.)

An Inventory of Proposed City Projects, Duluth, Minn.—In "The Taxpayers' Business," issued by the Taxpayers' League of St. Louis County, Inc., Duluth, Minn. February 25, 1924. 16 pp. Answering the questions: What Do We Want! What Do We Need! What Can We Afford! The cost of the proposed improvements approximates $40,000,000. They cover sanitation, public health, safety; traffic facilitation—paving; public service and convenience; education; parks and recreation. (Apply to the League, 313 Torrey Building, Duluth, Minn.)



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Minor Highway Privileges as a Source of Municipal Revenue in Nine Cities of the United States.—Including sub-sidewalk vaults or tunnels, overhanging signs, building balconies or other projections, switch tracks, etc. Report prepared by Bureau of Statistics and Municipal Reference Library, 1005 City Hall, Chicago, Ill. March, 1924. 12 typewritten pp. (Apply to Frederick Rex, Municipal Reference Librarian.)

Public Indebtedness in Indiana.—Tables showing bonded and other interest-bearing indebtedness of the state of Indiana and of each county, civil township, civil city, school city, civil town, and school town thereof. Prepared by the Legislative Reference Bureau, Indianapolis. Bulletin No. 5, Vol. IX, of the Extension Division, Indiana University, January, 1924. 39 pp. (Apply to the Bureau, State House, Indianapolis.)

Plan Book of Small Homes.—Three, Four, Five and Six Rooms. Prepared for Better Homes in America by the Architects' Small House Service Bureau of the United States, Inc. 1924. Photographs and plans. 32 pp. 25 cents. (Apply to the Bureau, 1200 Second Ave., South, Minneapolis, Minn.)

Business-Managing Our Cities.—By Dorsey W. Hyde, Jr., Assistant Manager, Civic Development Department, Chamber of Commerce of the United States. Reprinted from The Nation's Business for March, 1924. 6 pp. (Apply to the author.)

Mistakes to be Avoided in Zoning.—By Lawrence Veiller, Secretary, National Housing Association. Address before the convention of National Association of Real Estate Boards, June 28, 1923. Issued by The City Plan Commission, Detroit, Mich., September, 1923. 7 pp. (Apply to the Commission.)

Comparative Statement of Expenditures.—Presents a comparative statistical study of municipal expenditures for Colorado cities and towns having a population of 2,000 or over in 1922. Prepared by Bureau of Business and Governmental Research, Extension Division, University of Colorado, Boulder, Colo. Figures were taken from annual statements published by the various cities represented. 10 mimeographed pages. (Apply to the Bureau.)

Recarbonization of Softened Water.—By Nicholas S. Hill, Jr. Reprinted from the Journal of the American Water Works Association, March, 1924. 16 pp. (Apply to the author, 112 E. 19th Street, New York, N. Y.)

The Cantata of the Garden Cities.—Music by Magaglyo. Words by Georges Lauweryns. Published by Georges Benoit-Lévy, 11 rue Malebranche, Paris, France. 3 copies 4 shillings. (Apply to the publisher.)

Motor Vehicles.—Three pamphlets: Special Taxation for Motor Vehicles, 27 quarto pp.; Governmental Restrictions on Motor Vehicle Sizes, Weights and Speeds, 25 pp.; Governmental Regulation of Motor Vehicle Common Carriers, 27 pp. Published by Motor Vehicle Conference Committee, 366 Madison Avenue, New York, N. Y. January, 1924. (Apply to the publishers.)

Municipal Bond Sales.—A record of the domestic and foreign government, state and municipal bond sales in the United States during the year 1923. Published by The Bond Buyer, 67 Pearl Street, New York, N. Y. 113 pp. $10. (Apply to the publishers.)

West Hartford Zoning.—By Robert Whitten. Report to the Zoning Commission on the zoning of West Hartford, Conn., explaining the proposed zoning regulations and discussing steps that should be taken in the future to provide in a comprehensive way for the planning of the unsubdivided areas. March 3, 1924. 20 pp. (Apply to the author, 4614 Prospect Avenue, Cleveland, Ohio.)

National Health Series.—Five pocket-size books with flexible covers: Community Health—How to Obtain and Preserve It, by Donald B. Armstrong, M. D., Sc. D., Executive Officer, National Health Council, 65 pp.; Man and the Microbe—How Communicable Diseases Are Controlled, by Charles-Edward Amory Winslow, Dr. P. H., Professor of Public Health, Yale School of Medicine, 68 pp.; The Baby's Health, by Richard A. Bolt, M. D., Gr. P. H., Director, Medical Service, American Child Health Association, 38 pp.; Personal Hygiene—The Rules for Right Living, by Allen J. McLaughlin, M. D., Surgeon, U. S. Public Health Service, assisted by James A. Tobey, M. S., Administrative Secretary, National Health Council, 63 pp.; Cancer—Nature, Diagnosis, and Cure, by Francis Carter Wood, M. D., Director, Institute of Cancer Research, Columbia University, 67 pp. 1924. 30 cents each. (Apply to Funk & Wagnalls Company, New York.)

Why Cities Are Changing to Commission-Manager Form of Government.—By R. E. McDonnell. Pocket size. 8 pp. 2 folding maps. (Free on application to Burns & McDonnell, consulting engineers, Kansas City, Mo.)

Examples of Community Enterprises in Louisiana.—By Augustus W. Hayes, Associate Professor of Sociology, The Tulane University of Louisiana. Research Bulletin No. 3, October, 1923, issued by the University and the United States Department of Agriculture cooperating. 48 pp. Illustrated. Bringing out in every case how the institution, organization or enterprise reached its present status, what it is doing, and how it keeps functioning; often told in the words of the workers themselves. (Apply to The Tulane University of Louisiana.)

Industrial Schools.—Organization and Administration of General Industrial Schools or Classes in Communities of Less Than 25,000 Inhabitants. University of the State of New York Bulletin, October 1, 1923. 17 pp. Prepared by Robert H. Rodgers, supervisor of industrial education. The revised plan for this type of work has decreased the required number of hours devoted to the industrial subjects, thereby making it possible to develop a general industrial education program in conjunction with the regular academic subjects of the grade or high school. (Apply to Lewis A. Wilson, Director, Division of Vocational and Extension Education, University of the State of New York, Albany, N. Y.)

First Aid to Traffic—What to Do Till the City Planner Comes—Suggestions for the Prevention of Traffic Accidents.—By George G. Kelcey, Manager, Engineering Division, American Gas Accumulator Company, Elizabeth, N. J. Excerpts from papers presented before the United States Committee for the District of Columbia and the National Safety Council at its Annual Congress in Buffalo. Reprinted through the courtesy of the National Safety Council from the November, 1923, issue of "Highway Transportation," New York. 12 pp. Photographs, diagrams. Suggesting avenues of investigation by municipalities, leading to plans of action which will take advantage of existing opportunities for traffic improvement at the least expense. (Apply to author.)

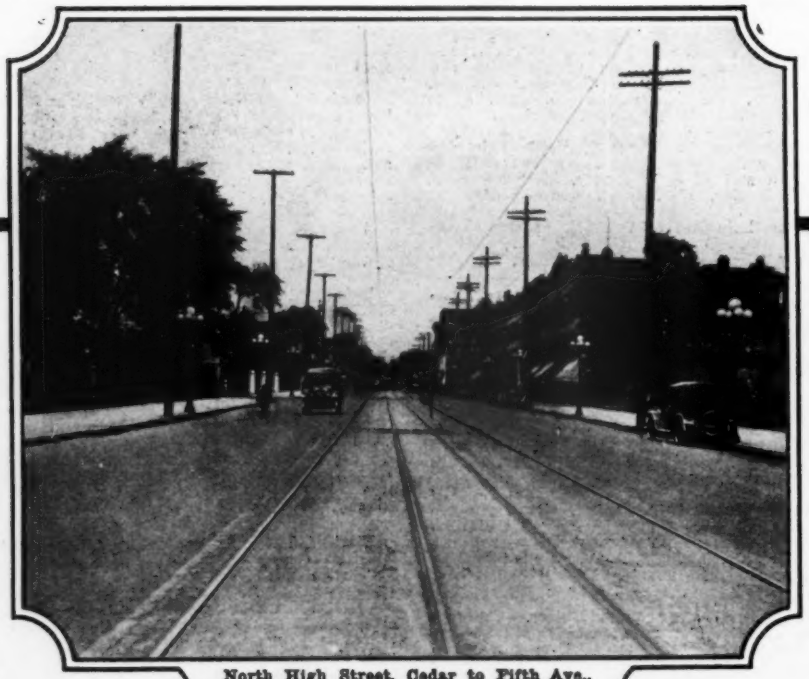
Platting Guide, Milwaukee, Wis.—For owners, realtors, engineers and agents who expect to subdivide land into lots within a mile and a half beyond the city limits. Suggestions recommended by the Milwaukee Real Estate Board and the Committee on Buildings, Grounds and Bridges of the Common Council. 31 quarto pp. Maps, views, diagrams. 25 cents. Published by the Board of Public Land Commissioners. January, 1924. (Apply to Gardner S. Rogers, City Planning Engineer of the Board.)

Prison Industries.—Message from the Governor of New York State Recommending Reorganization of the Prison Industries, with a Report by the Board of Estimate and Control on the Prison Industries. Legislative Document (1924) No. 55. 48 pp. The Governor believes that in order to solve the problems presented, "we must set up an industrial organization which, as nearly as present conditions permit, will parallel industrial organizations in private life." (Apply to the State Board of Estimate and Control, Albany, N. Y.)

The Civic Federation of Dallas, Texas.—Seventh Annual Directory, 1924. Listing the Dallas agencies for civic and social progress and promotion of health and education, and state organizations and boards. Compiled and published by the Civic Federation of Dallas, 415-18 Mercantile Bank Building, Dallas, Texas. February, 1924. 25 cents. 32 pp. (Apply to the Federation.)

Education Law, New York State.—As amended to July 1, 1923. University of the State of New York Bulletin, June 15, 1923. 381 pp. (Apply to Lewis A. Wilson, Director, Division of Extension Education, Albany, N. Y.)

City Ordinances.—What Our City Councils Are Doing. Brief list of references to ordinances introduced in, or passed by, the city councils of large cities from September 1, 1923, to February 25, 1924. 5 mimeographed sheets. 2 cents postage. (Apply to Municipal Reference Library, 1005 City Hall, Chicago, Ill.)



North High Street, Cedar to Fifth Ave., one of the many splendid Trinidad Lake Asphalt Streets in Columbus, O.

From Babylon to Columbus

Centuries B. C., Nabopolassar, King of Babylon, used asphalt as a binder for street construction. Nebuchadnezzar, his son, employed it even more extensively.

Today, in Columbus, O., as in other cities and towns throughout the world, Trinidad Native-Lake Asphalt paving has proven its tremendous superiority over any other bituminous material—its longer life and lower maintenance cost.

We have some interesting data regarding this remarkable ages-old, ages-seasoned asphalt. Write for it.

THE BARBER ASPHALT COMPANY

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TRINIDAD LAKE ASPHALT

Harmon Foundation.—Year Book for 1923. Published February, 1924. 23 pp. (Apply to the Foundation, 140 Nassau Street, New York, N. Y.)

Fitchburg, Mass.—Annual Report of the Commissioner of Public Works for 1922. (Apply to David A. Hartwell, Commissioner of Public Works.)

Goderich, Ont.—Auditors' Financial Statement for 1923. (Apply to either of the auditors, A. M. Robertson or H. R. Long.)

Johnstown, N. Y.—Annual Report of the Board of Water Commissioners, for 1923. (Apply to Thomas A. Sutton, President of the Board.)

Kalispell, Mont.—Annual Report of the Water Department for 1923. (Apply to W. H. Lawrence, Superintendent.)

Lynchburg, Va.—Annual Report of city for year ending January 31, 1924. (Apply to Edward A. Beck, City Manager.)

Pasadena, Calif.—Sixteenth Annual Report of the Municipal Light and Power Department, for 1922-1923. (Apply to C. W. Koiner, City Manager.)

Waynesboro, Pa.—Annual Statement of the Borough of Waynesboro, Pa.—Showing the financial condition of the borough and containing a statement of receipts and expenditures for the fiscal year ending December 31, 1923. (Apply to A. Stover Fitz, Borough Manager.)

Wilmington, Del.—Annual Report of the Board of Water Commissioners for the fiscal year 1922-1923. (Apply to S. Newbold Van Trump, Chief Engineer of the Water Department.)

On the Calendar of Conventions

MAY 7-8.—PARIS, TEX.
League of Texas Municipalities. Annual convention. Executive Secretary, Frank M. Stewart, Government Research Division, Bureau of Extension, University of Texas, Austin, Tex.

MAY 10-13.—WASHINGTON, D. C.
American Association of Museums. Annual meeting. Secretary, Laurence Vail Coleman, American Museum of Safety, 141 East 29th Street, New York, N. Y.

MAY 13-15.—ATLANTIC CITY, N. J.
National Fire Protection Association. Annual meeting. Secretary, Franklin H. Wentworth, 40 Central Street, Boston, Mass.

MAY 19-23.—ATLANTIC CITY, N. J.
National Electric Light Association. Annual meeting. Executive Manager, M. H. Aylesworth, 29 West 39th Street, New York, N. Y.

MAY 19-24.—NEW YORK, N. Y.
American Water Works Association. Annual convention. Address: W. M. Niesley, 170 Broadway, New York, N. Y.

MAY 20-22.—LIMA, OHIO.
National Firemen's Association of the United States. Annual convention. Secretary, Capt. J. E. Mersch, 750 Chicago Avenue, Evanston, Ill.

MAY 21-23.—WASHINGTON, D. C.
American Institute of Architects. Annual convention. Executive Secretary, E. C. Kemper, The Octagon, Washington, D. C.

MAY 26-29.—WASHINGTON, D. C.
Annual Conference on Weights and Measures. Secretary, H. E. Holbrook, Bureau of Standards, Department of Commerce, Washington, D. C.

JUNE 3-5.—ROCHESTER, N. Y.
Conference of Mayors and Other City Officials of the State of New York. Annual conference. Secretary, William P. Capes, 25 Washington Avenue, Albany, N. Y.

JUNE 3-6.—WASHINGTON, D. C.
National Association of Real Estate Boards. Annual convention. Executive Secretary, Herbert U. Nelson, 1428 Consumers Building, Chicago, Ill.

JUNE 5-7.—MINERAL WELLS, TEX.
Texas Commercial Executives' Association. Annual convention-school. Secretary, O. C. B. Nair, Corsicana, Tex.

JUNE 5-7.—CINCINNATI, OHIO.
United States Junior Chamber of Commerce. Annual convention. Secretary, Elias Roos, Brumder Building, Milwaukee, Wis.

JUNE 9-14.—DETROIT, MICH.
National Assembly of Civil Service Commissions. Annual meeting. Secretary, Charles S. Shaughnessy, Civil Service Commission, Philadelphia, Pa.

JUNE 10-12.—KENSINGTON, PA.
Pennsylvania State Association of Boroughs. Annual convention. Secretary, J. Herman Knisely, Capitol Building, Harrisburg, Pa.

JUNE 11-14.—SAN FRANCISCO, CALIF.
American Association of Engineers. Annual convention. Secretary, C. E. Drayer, 63 East Adams Street, Chicago, Ill.

JUNE 13-14.—MIDDLETOWN, OHIO.
Ohio Commercial Secretaries Association. Annual meeting. Secretary, Avery G. Clinger, Chamber of Commerce, Columbus, Ohio.

JUNE 17-19.—PROVIDENCE, R. I.
National Association of Comptrollers and Accounting Officers. Annual convention. Secretary, Mark M. Foote, Comptroller's Office, Chicago, Ill.

JUNE 19-20.—DETROIT, MINN.
League of Minnesota Municipalities. Annual convention. Executive Secretary, Morris B. Lambie, The Municipal Reference Library, University of Minnesota, Minneapolis, Minn.

JUNE 23-27.—CHICAGO, ILL.
American Institute of Electrical Engineers. Annual convention. Secretary, F. L. Hutchinson, 33 West 39th Street, New York, N. Y.

JUNE 24-26.—BOSTON, MASS.
New England Association of Fire Chiefs. Annual convention. Secretary, Chief John W. O'Hearn, Watertown, Mass.

JUNE 24-27.—NEW BRUNSWICK, CANADA.
Canadian Good Roads Association. Annual convention. Secretary, George A. McNamee, 909 New Birks Building, Montreal, Que.

JUNE 25-JULY 2.—TORONTO, ONT.
American Association for Community Organization. Annual meeting. Secretary, Pierce Williams, care National Information Bureau, 1 Madison Avenue, New York, N. Y.

JUNE 25-JULY 2.—TORONTO, ONT.
National Conference of Social Work. Annual meeting. Secretary, William H. Parker, 25 East 9th Street, Cincinnati, Ohio.

JUNE 30-JULY 5.—SARATOGA SPRINGS, N. Y.
American Library Association. Annual meeting. Executive Secretary, Carl H. Milam, 78 East Washington Street, Chicago, Ill.

JULY 2-9.—AMSTERDAM, HOLLAND.
International Town Planning Conference. Address: Organizing Secretary, International Garden Cities and Town Planning Federation, 3, Gray's Inn Place, London W. C. 1, England.

JULY 14-18.—MONTREAL, CANADA.
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

JULY 20-26.—PALO ALTO, CALIF.
Western Summer School of Community Leadership. Address: Professor Edwin A. Cottrell, Stanford University, Calif.

JULY 20-AUGUST 2.—EVANSTON, ILL.
National School for Commercial and Trade Executives. Address: Robert B. Beach, Business Manager, Chicago Association of Commerce, Chicago, Ill.

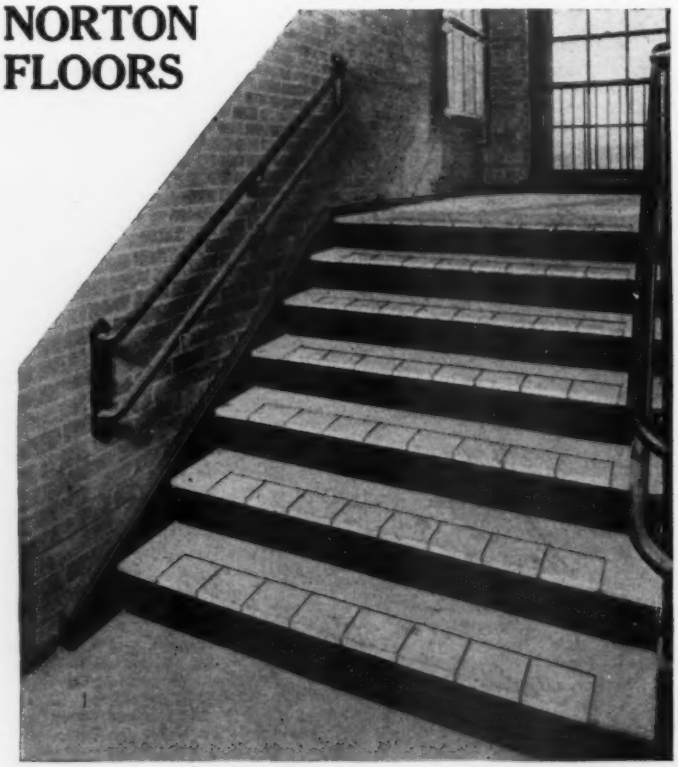
AUGUST 19-22.—BUFFALO, N. Y.
International Association of Fire Engineers. Annual convention. Secretary, James J. Mulcahey, Yonkers, N. Y.

SEPTEMBER 23-26.—ROCHESTER, N. Y.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

SEPTEMBER 29-OCTOBER 3.—BOSTON, MASS.
American Society for Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, P. O. Box 234, St. Petersburg, Fla.

OCTOBER 20-22.—WASHINGTON, D. C.
National Association of Commercial Organization Secretaries. Annual convention. Secretary-Treasurer, Raymond B. Gibbs, Kansas City, Kans.

NORTON FLOORS



Meet Schoolhouse Requirements

Safety and durability are the chief requisites of schoolhouse construction. Norton Floors meet both for they are slip-proof and wear-resisting.

The Clifton Park High School, Baltimore, is one of many where Alundum Tile has been used on the stairways to make them safe for the careless hurrying feet of children and to prevent worn hollows due to the unusually severe traffic to which such stairways are subjected.

There is a Norton Floor suitable for all types of schoolhouse construction.

NORTON COMPANY

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News and Illustrations

Items of Interest to City, Town and County Officials, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

Patching with Rock Asphalt

Many cities are using Kyrock, the rock asphalt produced by the Kentucky Rock Asphalt Company, Marion E. Taylor Building, Louisville, Ky., for patching old pavements, and are finding it both satisfactory and economical. Kyrock has the advantage of being laid cold and is always ready to lay without mixing or special equipment.

The time to repair a break in a pavement is when the break occurs. It is often true in smaller cities without heating and mixing equipment that street maintenance is neglected until a complete new pavement is required. Cities and counties using rock asphalt for maintenance keep a supply of material in storage and mix and repair as soon as it is needed.

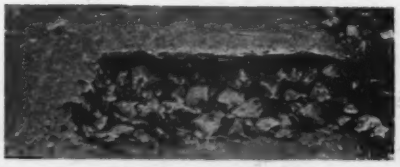
When asphalt pavements are to be patched with rock asphalt, the old surface should be cut away, leaving the edges perpendicular. The base is then restored and the hole cleaned out. Dirt and dust must be removed, and this can be done either by brooming or with a bellows. The edges of the old surface should be painted with an asphaltic cement, which is not necessary where an old pavement of rock asphalt is being repaired. The hole is then filled with the rock asphalt and crowned up slightly above the old pavement. It is tamped thoroughly, and the patch is complete. After a few days' traffic the patch may not be distinguished from the surrounding pavement.

Where slight depressions occur in an asphalt pavement, rock asphalt skin patches are successful. The old asphalt need not be disturbed, but should be thoroughly cleaned. The area should be painted before the rock asphalt is applied, and the patch may be feathered at the edges.

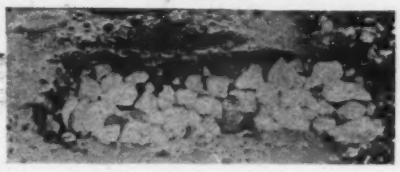
In patching old brick or block pavements, it is often necessary to remove the bricks to repair the base. In such cases the base, if concrete, may be restored by filling the hole with cement concrete, pouring the mixture to within 1½ inches of the top of the old surface. The hole should then be cleaned and painted with asphaltic cement before the rock asphalt is shoveled into place and tamped.

Most patching of brick pavement, however, is required because of slight depressions due to settling or to actual wear of the bricks. Because of its fine sand aggregate, Kyrock is especially adapted to such work. The edges of the patch feather out to almost nothing.

In patching brick or block pavements with Kyrock, the hole should be coated with an asphaltic paint to protect the patch from moisture and to absorb any dust on the old surface. This is particularly important in making feathered-edge patches. Asphaltic cement used as a paint coat should be either an asphalt cut back with gasoline or an asphalt emulsion.

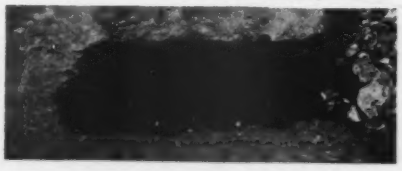


Cut away the old surface



Repair the foundation

Old rock asphalt may be used again



Fill with rock asphalt and crown

Tamp, and the patch is complete

HOW TO PATCH WITH ROCK ASPHALT

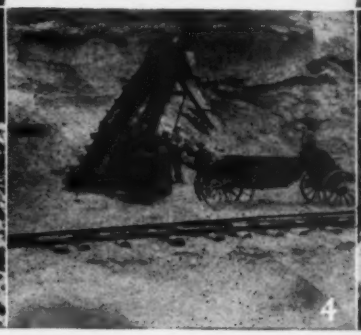
1—This Barber-Greene saved McGuire & Rolfe, Inc., $3000 last season, picking up excavation in Richmond, Va.

2—Working in close quarters at McGrady Bros., Pittsburgh, five yards of material were loaded in three minutes.

3—The disc feeder digging into stone. No shovel clean-up is ever needed.

4—In the summer, Worcester, Mass., converts its snow loader into a bucket loader. It loads a gravel car in one-fourth the time eight men previously required.

5—The street commissioner of Worcester says his Barber-Greene Snow Loader takes the place of 100 men.



The double-purpose loader

Loading sand and stone in summer—loading snow in winter

The same Barber-Greene that can clear a heavy snow from an entire city block in 15 minutes, can with a slight change replace a gang of 10 to 20 men on street paving in the summer.

The snow boom is quickly replaced with a bucket loader boom, and the Barber-Greene is prepared for a season's work in sand or gravel, coal or cinders.

With its disc feeder, it digs into any material, cleaning it up without the aid of a single shoveler.

A single Barber-Greene Bucket Loader sped up production 40% and eliminated a large labor gang for the Trinidad Asphalt Company, on a street paving job in St. Louis, Mo. It brought about an average daily run of 1,555 square yards, with a maximum of 1,777 square yards.

McGuire & Rolfe, Inc., of Richmond, Va., used two Barber-Greenes. One of them, loading gravel from storage piles, handled 18 cubic feet in 30 seconds—and 20,000 tons in a season. The other machine was used at an asphalt plant and on subgrade work. Replacing 8 to 10 shovelers at picking up excavation, it saved the company $3,000.

Cities that have found the Barber-Greene to be the swiftest, most flexible and economical of all bucket loaders, have also found it to be the one best means of minimizing the business losses that formerly accompanied every heavy snow.

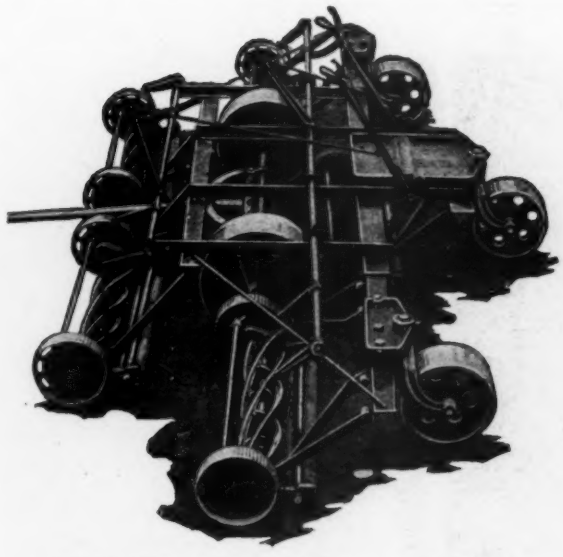
Our two booklets, "Mechanical Snow Handling" and "Results on Road Jobs," show in a striking way the snow-removal methods and the road-building methods adopted in many different sections of the country. They explain the double economy of the Barber-Greene. Send for them now.

BARBER-GREENE COMPANY—*Representatives in Fifty Cities*—515 W. Park Avenue, Aurora, Illinois

BARBER GREENE

Portable Belt Conveyors — Self Feeding Bucket Loaders

Automatic Ditch Diggers



A FIVE-MOWER HITCH FOR USE WITH A LIGHT TRACTOR

Improving Public Grounds

Superintendents of parks, cemeteries and public grounds find that their appropriations for lawn maintenance require close figuring. Usually the labor is limited and employees are unskilled. For these reasons, they must consider labor-saving features of motor-operated lawn-mowers. Three- and five-unit machines drawn by Fordson or other light tractors make ideal combinations.

The Ideal Power Lawn Mower Company, 400 Kalamazoo Street, Lansing, Mich., makes a fast, dependable mowing outfit, which is used on a great number of golf courses, public parks and other large grounds where there is a power-plant in use for general duties. By utilizing the light tractor already owned by the city, it is possible to avoid the purchase of additional power equipment. This outfit in three- or five-unit combination provides particular advantages, inasmuch as the Ideal Bull Dog cutting units are especially designed for power cutting. The mower has levers for raising the cutting units, and wide-faced traction wheels and casters for carrying the weight of the assembly. The outfit is a distinct economy and improvement over the horse-drawn mower and is said to quickly pay for its cost in the saving of labor and the improved appearance of the lawn. It is guaranteed by the manufacturer to stand the hard, steady grind of mowing grass behind a Fordson or other light-weight tractor. The assembly is so built that there is no bearing weight on the cutting units, which swing freely by suspension hangers. The power for turning the cutter reel is derived entirely from the traction of the cutting wheels of the cutting unit.

Each cutting unit operates independently, thus preventing possible injury to the entire outfit. Should an obstruction strike one of the blades, it would be unlikely to cause breakage, as it merely stops the rotation of the individual cutting unit, causing the wheels to slide.

The same method of attaching cutting mowers to the frame is employed as in all other Ideal mowers. The mowers are pushed the same as a hand mower is pushed—at the side plates, instead of pulling from the shrub rod. This holds the mower to its work and prevents the back from jumping up in heavy grass.

The device can be quickly detached from the tractor by unhooking the simple clevis and draw-bar hitch, thus releasing the tractor for other work.

Park Cable for Series Lighting Circuits

A new park cable, intended for use in series lighting circuits for municipal street lighting, white way installations and park or playground illuminating systems, has been placed on the market by the Simplex Wire and Cable Company, 210 Devonshire Street, Boston, Mass., under the name of Condex park cable. This cable consists of an insulated lead-covered conductor, such as is ordinarily used for series street-lighting circuits, protected by an interlocking steel tape under and over which is a bed saturated with a preservative compound. It is claimed to be a distinctly different type of steel-taped cable from that which has been used so extensively during the last 15 or 20 years.

The flexible locked steel conduit is a steel tape applied spirally around the lead-covered conductor. This steel armor and the unique way in which it is applied form the main distinguishing feature of Condex park cable. The steel completely covers the cable under all conditions and is securely locked together in such a way that there is little possibility of any portion of the cable becoming exposed to mechanical injury. The arch form of the overlapping, interlocking steel gives unusual resistance to crushing.

The bedding between the lead and the steel tape consists of a fabric of sufficient weight and thickness to furnish ample protection. Before being applied, it is thoroughly impregnated with a preservative compound. The outer covering is a serving of jute thoroughly saturated with preservative compound similar to that used on the bedding. The outer surface of the cable is finished so that it is not objectionable to handle.

The preservative compound which is applied over the lead and between the various protecting layers prevents rotting and deterioration of the fabric by moisture or from other causes. It also covers the entire surface of the steel, working itself into the overlapping locking feature in such a way as to insure the flexible conduit against rusting.

With this type of cable, conduits are unnecessary and manholes need not be constructed. Very little digging is required to obtain a satisfactory installation, as the cable can be laid in a shallow trench in the ground, where it is feasible to dig such a trench, or it can be placed under the pavement on a city street by simply removing one course of paving blocks and placing the cable in the bedding under them.

CIVIC IMPROVEMENTS

economically and permanently accomplished by Excelsior Fence

Installation shown is an Excelsior Rustproof Chain Link, the ORIGINAL Hot Galvanized After Weaving Chain Link Fence, proved to be the most durable by more than five years' actual service under all kinds of conditions.

Excelsior Rustproof Ornamental Wire Fence is the strongest and most durable ornamental wire fence made.

Excelsior Iron Fence and Gates furnished in a variety of designs and sizes.

The Wickwire Spencer engineering department will be glad to furnish recommendations and estimates of fence types to meet your particular requirements.

Catalog upon request.

EXCELSIOR
HOT GALVANIZED AFTER WEAVING
WIRE FENCES

WICKWIRE SPENCER STEEL CORPORATION
Fence Department
WORCESTER, MASSACHUSETTS

New York Buffalo Philadelphia Detroit Chicago
San Francisco Los Angeles

"CLOSE UPS" OF FAMOUS SEWER BUGS

Sanitary Sewers an Aid to the Health of the Community

Many home owners when calculating the cost of sewers and water-works fail to consider the expense resulting from the repeated cleaning of the old style of privy vaults or cesspools. Cleaning must be done periodically, and the cost may vary from $5 to $19 per load. Several loads must be frequently taken out. This money would go far toward paying the cost of sanitary sewers. After the sewers are put in there is no cleaning charge to pay. To the expense of cleaning privy vaults or cesspools, there must be added the offensiveness of odors which necessarily accompany the job of cleaning.

When you send your child to school, you must take into account the contacts he will make there, physical, mental and moral. If there are no sewers, and sanitary conditions in the town are bad, your child will have many chances to contract contagious diseases. If the toilets, the lavatories and the drinking arrangements of the school are old-fashioned and unsanitary, you need not be surprised at his bringing diseases home. When the city does not have the protection afforded by pure water and sewers, an epidemic may break out at any time and sweep unhindered through the entire community. Schools should abolish the outdoor toilet, which is always a breeder of disease and frequently of immorality. A modern school with sewer connections does not have this dangerous institution.

Stagnant pools, ponds, open drains, decomposing refuse, open privies and cesspools help to keep alive the mosquitoes and flies which carry the germs of malaria, typhoid, tuberculosis, dysentery, etc. Sanitary sewers offer remedies for such insanitary conditions.

The W. S. Dickey Clay Manufacturing Co., 203 New York Life Building, Kansas City, Mo., and the Clay Products Association, 133 West Washington Street, Chicago, Ill., are distributing an interesting pamphlet, "Disease Devils—Let's Help Chase Them Out of Town," the front cover of which depicts the caricatures of the germs of malaria, typhoid, influenza and tuberculosis, shown above.

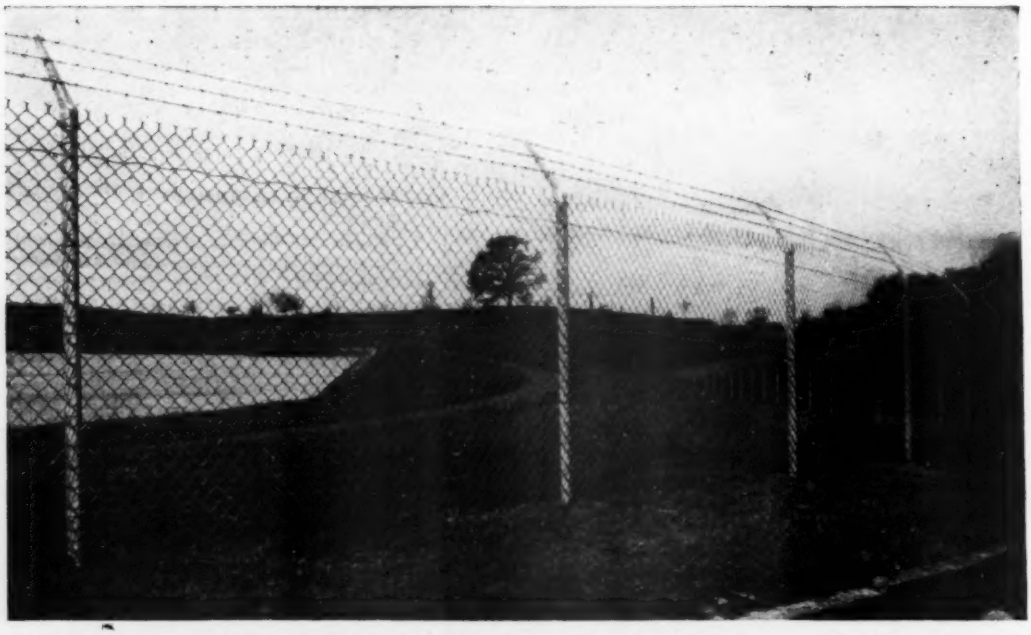
This booklet, which is devoid of advertising, is admirable for use in sewer bond campaigns as a piece of educational literature.

Stationary Circular Travel Rings

A very interesting piece of playground apparatus in the shape of stationary circular travel rings which do not revolve, is made by the Patterson-Williams Manufacturing Company, 501-507 West San Fernando Street, San Jose, Calif. In spite of the fact that this apparatus does not revolve, it furnishes an endless-ring path which permits children to swing from ring to ring, pulling, stretching and developing every muscle of their bodies. Unlike the straightaway travel rings, the circular arrangement forces reaching and stretching of the arms and legs in a position different from similar apparatus. Races can be held on the apparatus, as the path is as long as the child cares to go around. It is an economical piece of apparatus for the reason that it is long enough for the hardiest and yet occupies the minimum space.

The rings are mounted in a 9-foot circle, 3 feet apart, making it an interesting feat to negotiate one ring after another. The rings are so arranged that they can be used as gymnastic rings by four children at a time. An inclined board is furnished with the outfit for the use of smaller children in starting. Because of its circular arrangement, the outfit requires approximately one-twelfth of the space of the ordinary traveling rings. The rings themselves are of aluminum bronze with an aluminum grip. The apparatus stands 12 feet high and weighs 270 pounds without the supporting pipe, and 470 pounds with it. The aluminum hand-grip rings are mounted 6 feet 3 inches from the ground, and all parts of the equipment are galvanized.

AN ENDLESS LINE OF SWINGING RINGS



This high, unclimbable Anchor Post Chain Link Fence safeguards the water supply of the City of Newark, N. J. It surrounds the Cedar Grove Reservoir.

Effective Protection Against Water Pollution

Maintaining the purity of water supply, in the face of many possible sources of pollution, is a job of no mean proportion.

Even though the Waterworks Superintendent or Engineer provides almost every possible safeguard against contamination—should he fail to provide just one reasonable means of protection, he is exposed to censure and blame.

A high, unclimbable Anchor Post Fence, of the type shown above, is an unfailing ally of the Waterworks Superintendent or Engineer—and a very necessary means of reservoir protection. It is an ever-vigilant watchman—an impassable barrier against every trespasser danger.

If your reservoirs are unfenced—still open to many possible sources of pollution—the consideration of adequate fence protection deserves your immediate attention. A phone call, wire or letter to the nearest Anchor Post office or sales agent will bring you full cooperation and complete information regarding reservoir fences.

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FIRM-*because Anchored* PERMANENT-*because Galvanized*

The New Belle Isle Bridge, Detroit

Excluding the cost of the subway under Jefferson Avenue, Detroit, the new Belle Isle Bridge, connecting the automobile city with its playground on Belle Isle, will cost about $2,500,000. It has required 27 months to build and is 2,200 feet long, this being 428 feet shorter than the old bridge because of the dirt fill on the Belle Isle end. The new bridge is nearly twice as wide as the old bridge, measuring 87 feet against 44 feet for the earlier structure. The old bridge had two 9-foot sidewalks, while the new bridge has two 14-foot sidewalks.

From curb to curb the old bridge was 26 feet, and the new is 59 feet. It measures 30 feet above water-level and the channel, having a rise of 8 feet from the Detroit side to the top of the crown and a drop of 16 feet to the Belle Isle shore. There is a total of 3,018 tons of structural steel and 20,000 cubic yards of concrete in the structure.

The 4,388 feet of attractive railing for the Belle Isle bridge was made by the Stewart Iron Works Company, Cincinnati, Ohio, and sold through its Detroit representative, C. A. Weigel, 2175 Bellevue Avenue. Esselstyn, Murphy and Burns, 3456 Cass Avenue, Detroit, Mich., are the engineers and architects for the bridge.

SECTION OF SIDE-RAIL ON BELLE ISLE BRIDGE, DETROIT, SHOWING THE TYPE OF LIGHTING STANDARD INSTALLED

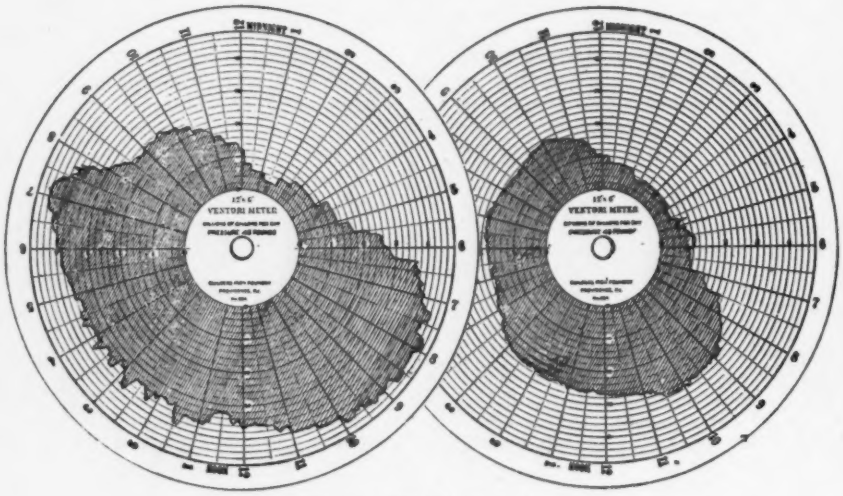
A NEW TYPE OF LAWN-MOWER THAT WEIGHS ONLY 7½ POUNDS

A New Type of Lawn-Mower

A new type of lawn-mower which weighs only 7½ pounds and which is claimed to be almost silent in operation has been brought out by the Montague Manufacturing Company, 148-154 Lewis Street, Grand Rapids, Mich. When held in the ordinary position, this new machine, known as the MontaMower, cuts the grass approximately one inch long, which is the proper length, according to the government bulletin on the care of lawns.

The cutter consists of two sharp-edged cutting discs which revolve toward each other, slightly overlapping. The grass is gathered in by the cutters and cut off at the intersection of these discs. There are eight groups of cutters, each having a drive-wheel of its own on which the mower runs. All drive-wheels are solidly welded to the main shaft so that all the cutters revolve, even though each wheel does not have traction. The cutters and discs are heavy and have adequate strength to stand up well. New cutters are furnished at about the cost of sharpening an ordinary mower, when the original cutters show wear.

AFTER THE BATTLE



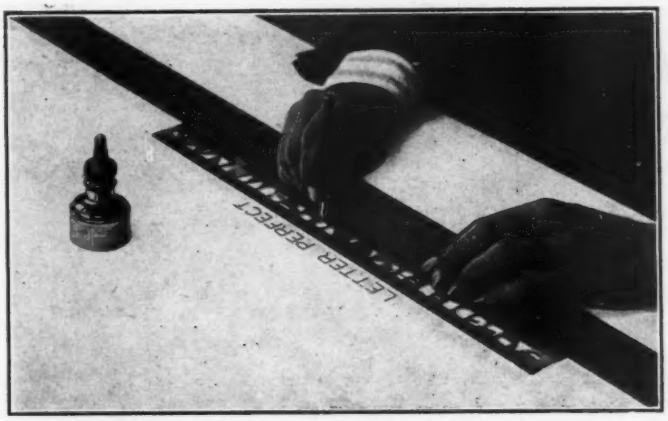
Venturi Charts Which Tell the Story
(Greatly reduced in size)

The BATTLE between CONSERVATION and WATER WASTE, if successfully waged, means wise provision against the dreaded period of water shortage.

With VENTURI METERS on the main pump and distribution lines, the winning of the battle becomes a practical certainty.

BUILDERS IRON FOUNDRY
PROVIDENCE, R. I.
"Builders of the Venturi for 33 Years"

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.



USING A LETTERING GUIDE MAKES LETTERS PERFECT

A New Lettering Guide

It is difficult, even in these days of great productivity of engineering schools, to find men who can letter rapidly, well and uniformly. In order to make use of men with little training and to produce uniform lettering for engineering work, the Wood-Regan Instrument Company, 154 Nassau Street, New York City, has developed the Wrico lettering guide and lettering pens.

The lettering guide illustrated below in half-size consists of a strip of transparent green Pyralin perforated with various openings, which are readily combined to form all the letters of the alphabet, the numerals and the various symbols. The guide is grooved on the underside so that it may be moved from one character to another without smearing the ink. A separate guide is provided for each size of letter from ⅛- to ½-inch, and each guide except the smallest may be used with four sizes of Wrico lettering pens, giving different bodies to the letters. One particular feature of the guide is the shift button, which, after the first portion of a letter is made, is slid to the end of the shift slot, pressed to the paper, and the guide shifted, bringing the second part of the letter exactly in the right position for completing the letter without delay on the part of the draftsman.

Wrico lettering pens have been designed particularly for use with the guides described above. The pens are made of a special non-corrosive bronze alloy of great strength and wearing qualities. The pens are made in five sizes, four of which may be used with any of the guides except the smallest, which is used only with the fifth pen. The different sizes of pen make it possible for the user to obtain lettering of a considerable range of appearance with each size of guide. The letter-pens are filled in the same manner as ordinary ruling pens, and the flow is regulated by turning the adjusting ring up or down as required. The pens may be easily cleaned by passing a piece of paper between the nibs.

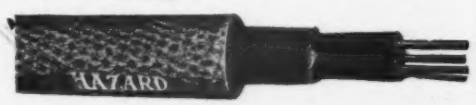
By the use of this lettering outfit, all characters are made uniformly and perfectly. The style is the standard vertical Gothic commonly used by engineering draftsmen, a style that is clean-cut and easily read and presents a pleasing appearance. Very little practice is necessary to operate these lettering guides quickly, and very soon it is possible to letter more rapidly than by any other method, including free hand lettering. It does away with the disadvantages of guide lines or previous blocking out of letters. All the characters and letters are made complete, so that no retouching or filling in is required. Inasmuch as the letters which have been completed and the outlines of the letter about to be made can be plainly seen through the lettering guide, it is easy to correctly space the letters. Blotting of the work is almost impossible, as the central portion of the guide is raised above the writing surface so that it may be moved without danger of smearing the ink.

Covered Cables for Overhead Construction

The specifications covering spiral-woven or loom-covered cables adopted by the International Association of Municipal Electricians at their meeting September 25-28, 1923, in Reading, Pa., are quite complete. Copies may be secured without charge from the Hazard Manufacturing Company, Wilkes-Barre, Pa.

Briefly, these specifications are for any number of conductors to be insulated with 30 per cent para rubber laid up in cable form, then covered with a tape and spiralweave or loom. The spiral-weave or loom is entirely different from the ordinary cotton braids such as are used in the manufacture of insulated wires and cables. It is made of much heavier material and is sometimes called fire-hose weave because of its similarity to the outer covering put on fire-hose.

The advantages of the use of this type of cable are many. All conductors are in one small, compact cable instead of a number of single conductors strung on poles. The cable is light, durable and easy to install. The outer covering is extra heavy and tough and resists wear and tear to a remarkable degree. It is so thoroughly water-



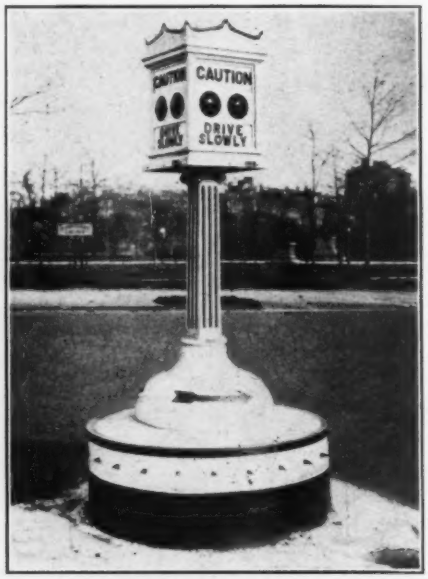
proof as to be almost absolutely water-tight. Maintenance expense is practically eliminated and fire-alarm superintendents' nights are not disturbed by reason of breakdowns during storms and high winds. It is very good for emergency work and can be installed and reinstalled repeatedly and can even be used underground in emergency when lead-covered cable is pulled out and something is needed temporarily.

The best method of installing the cable is to hang it in rings on messenger strands, although some fire-alarm superintendents hang the cable without the use of messenger strands and it has proved satisfactory. The use of the strand not only is the safer, but also makes a much neater and more efficient job.

NEW YORK CITY'S CHOICE

of Traffic Signals

Milliken Electric "Talking Lamp"



Type "A" Lamp in Central Park, New York City

One of the many installations throughout all five Boroughs of New York City which is giving constant satisfaction and is preventing accidents daily.

The two flashing lenses on each side not only distinguish this from any other light but attract immediate attention and the illuminated glass panels clearly show Police Regulations and road directions both day and night. Refracting lenses also illuminate the column and base—Connection with Street Lighting circuit and six standard electric light bulbs warrant against any possible failure in performance of duty.

Designed for simplicity and economy in operation. Undeniably attractive and artistic in appearance.

Send for full information.

TRAFFIC SIGNAL CORPORATION

50 Church St., New York City

In Canada

TRAFFIC SIGNAL CORPORATION, LIMITED

9 Richmond Street E. Toronto, Ont.

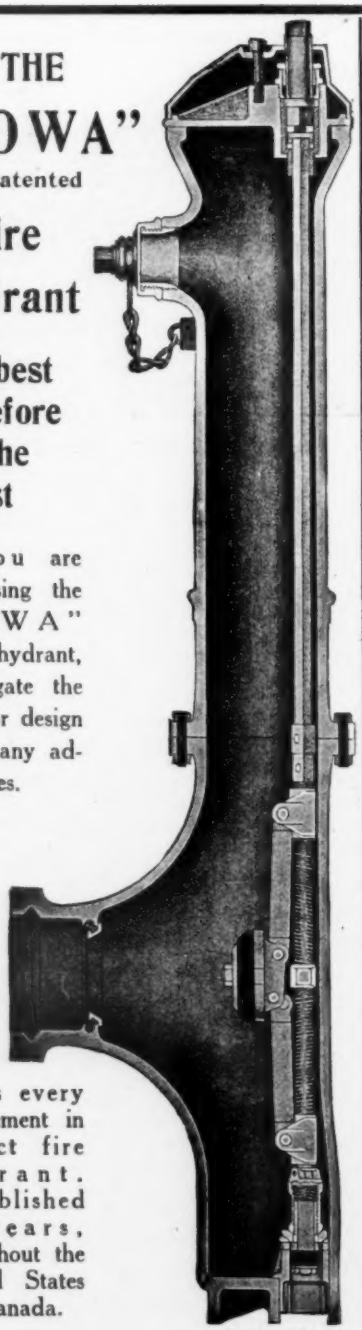
THE "IOWA"

Patented

Fire Hydrant

The best therefore not the oldest

If you are not using the "IOWA" fire hydrant, investigate the superior design and many advantages.



Covers every requirement in perfect fire hydrant. Established 15 years, throughout the United States and Canada.

Drain Closed

THE IOWA VALVE COMPANY

Oskaloosa, Iowa

Types of Fire Apparatus for Small-Town Service

Local conditions determine the type of equipment that should be purchased to secure maximum fire protection. For towns having a water-works system, with hydrants, which completely covers the town and provides sufficient pressure, the combination chemical engine and hose car equipment is generally recommended. If the water-works system does not provide uniformly good pressure or if it does not cover certain sections where a water-supply, such as ponds, cisterns, etc., is available, a triple-combination pump, chemical engine and hose car equipment is the best. Where there is no water-works system or other supply, a two-, three- or four-tank chemical engine equipment is recommended. The size and type of chassis best suited to the city is governed by the type of fire-fighting equipment with which it is to be combined. Each community has its own set of special conditions which must be studied by competent engineers before any specific recommendations can be made.

The Childs triple-combination pump, single-tank chemical engine and hose car equipment can be secured from the Foamite-Childs Corporation, Utica, N. Y., mounted on any commercial truck chassis. This equipment consists of a steel hose body with slatted wood bottom, capable of holding 1,000 feet of 2½-inch hose. The pump is of the rotary type with suction intakes on both sides, fitted with removable strainers and caps and discharge outlets in each side fitted with 2½-inch brass gate-valves. The pump is equipped with automatic and hand relief valves, pressure gages, and an auxiliary cooling system from pump to motor.

The chemical equipment consists of a stationary tank of 35 gallons capacity complete with a special acid sealing valve, agitator, overflow pipe and wash-out. The rest of the equipment is complete, and well built of good materials, and enables the fire department to readily handle any kind of fire within the limits of the equipment.

Rossiter Moves Office

The Edgar A. Rossiter Company on May 1 moved its offices to 1729 Burnham Building, 160 N. LaSalle Street, Chicago, Ill. This firm of consulting engineers has been in Chicago for over half a century, specializing in water-supply, sewerage and sewage disposal, drainage, farm and levee pumping plants, electric light systems, pavements, track elevation, tunnels and mining.

Road Machinery Company Moves Boston Office

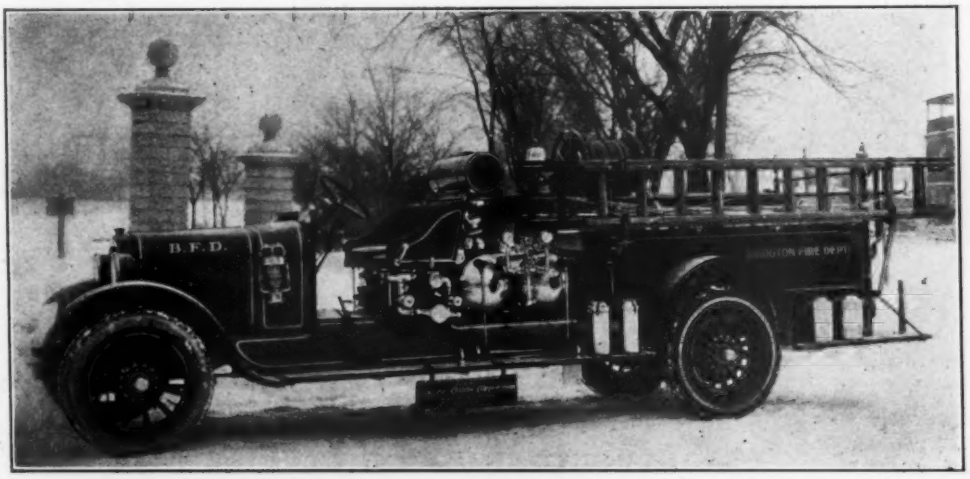
The Good Roads Machinery Company, Inc., Kennett Square, Pa., has announced the removal of its Boston office from 61 Oliver Street to 36 Pleasant Street, Watertown, Mass. At the new location, it has opened an office and a large warehouse which will operate for the better service of the New England trade.

New Chausse Agencies

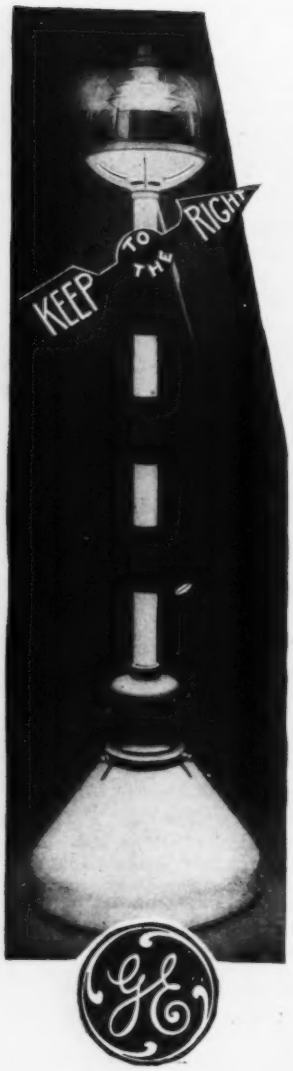
The Chausse Oil Burner Company, Goshen, Ind., has announced the appointment of the following sales agencies which will handle the sale of Chausse oil-burner tool and surface heaters and contractor's apparatus and salamanders in their respective territories: Bakstad Machinery Company, Peoples Gas Building, Chicago, Ill.; W. B. Spencer, 30 Church Street, New York, N. Y.; The Clark-Wilcox Company, 902 Chapel Street, New Haven, Conn.; Willamette Equipment Company, Portland, Ore.; Willamette Equipment Company, Tacoma, Wash.; Minneapolis Equipment Company, Minneapolis, Minn., and W. F. Cleary Sales Agency, Indianapolis, Ind.

Wire Company Changes Name

The increasing success of Copperweld wire, made by the molten welding process, has been such in the last few years that the name of the wire, "Copperweld," has completely subordinated the name of the manufacturing company, formerly known as the Copper Clad Steel Company. Because of this the name of the company has been changed to the Copperweld Steel Company. Its main office and mills are located at Braddock P. O., Rankin, Pa.



A CHILDS TRIPLE-COMBINATION PUMP, CHEMICAL AND HOSE EQUIPMENT PLACED IN SERVICE IN BRIDGTON, IN FEBRUARY, 1924



G-E Traffic Signals Distinctive—Effective Reliable

G-E traffic signals meet the needs of modern traffic regulation. The Novalux electric automatic flashing beacon (shown at left) gives a vivid streak of light, at regular intervals, that attracts the eye and flashes a real warning visible at all angles. It is an ideal signal for use in secondary street traffic in large cities and for general traffic in smaller communities.

The Novalux electric automatic signal tower is for heavier traffic. It may be set to operate at any predetermined interval (stopping traffic in one direction and starting it in the other) or it may be manually controlled.

Both of these types of signal are rendered dependable by a new mercury circuit-breaking mechanism which cannot fail through burned out contacts. Uninterrupted service is thus assured.

G-E street lighting specialists have full information on the newly developed line of G-E traffic signals. They can assist in the selection of the type most suited to each traffic condition.

Novalux Electric Automatic Signal Tower—stops and starts traffic at predetermined intervals or may be operated by hand

G-E traffic signals are the result of a careful study of traffic requirements by G-E illuminating engineers working in conjunction with the police commissioners of leading cities. They have been successful in actual service under varying conditions.

General Electric Company
Schenectady, N. Y.
Sales Offices in All Large Cities

35C-140

GENERAL ELECTRIC

A New Style of Street Sign

NEW TYPE OF STREET SIGN USED IN BOSTON

The Century Sign Company, 100 Colonial Road, Boston, Mass., has developed its line of signs made of asphalt, asbestos and cement, with aluminum letters, and has brought out the sign illustrated, for use on trolley posts or ornamental lighting standards.

This type of sign has been installed in several places in Boston, where they have been attached to electric light poles at corners of streets. Instead of the familiar horizontal sign, the letters are arranged vertically. The aluminum letters on the black background take the place of the gilt letters on a sanded background. These new signs are very ornamental. In the Boston signs, at the top is the seal of the city carved in the metal and standing out in bold relief, and the bottom of the sign is also ornamented.

A New Rubber Paving

Early in 1924, the Goodyear Tire and Rubber Company, Akron, Ohio, paved with rubber blocks a section of the street fronting its plant. These rubber blocks resemble common paving bricks in size and shape, with the exception of a tongue-and-groove construction on two sides which joins the blocks together in a close union. The bottom of the blocks and the wearing surface are smooth. With the ends and grooved sides dipped in a hot tar compound to form watertight joints, the blocks are laid on a concrete base and covered with a coating of the tar compound.

The Goodyear Company received permission from the Akron City Council to lay this section to test rubber block paving compounds and construction, as well as to determine the wearing effect of traffic upon the blocks themselves. A section 10 x 12 feet was laid in the street directly in front of one of the factory entrances where loaded trucks passing in and out will give the paving a thorough try-out. The purpose of rubber block paving is twofold. First, it reduces the traffic vibration found in other pavements, thus protecting the mechanism of vehicles riding over it, and on bridges it is said to be the means of cutting down on the steel work required to withstand vibration. It also minimizes the crystallization of the steel, because the rubber takes up part of the shock created by traffic. Second, rubber blocks reduce traffic noises and are expected to prove useful in hospital quiet zones, apartment courtyards, station platforms and other places where trucking and travel is considerable.

A New Traffic Control Device

The development of motor traffic has brought about one of the most difficult problems that city officials have to face. The increasing speed and number of motor vehicles have made it necessary to regulate traffic at more and more points, and the expense of detailing traffic officers has become very serious. This situation has brought forth many kinds of mechanical traffic regulators, two of the latest of which are manufactured by the Griswold Safety Signal Company, 414 Plymouth Building, Minneapolis, Minn.

The American Bobby danger signal is a narrow, vertical shaft which may be mounted between street-car tracks, or at any other point, without taking up very much space. The feature of both the American Bobby danger signal and the traffic regulator is that when it is struck it yields to the blow, and the car may pass over it uninjured. A collision that would smash a stationary signal, possibly wreck the car and injure the occupants, harms no one when the American Bobby is used. Severe tests were made of this signal before putting it on the market.

The danger signal is equipped with a red light at the top, which burns continuously, throwing out its warning directly in the line of vision of motorists. The traffic regulator illustrated gives alternate "Stop" and "Go" signals, the control being operated from a steel cabinet at the curb and

INSPECTING THE NEW RUBBER ROAD LAID BY THE GOODYEAR COMPANY

STOP
ADLAKE
Electric
FLASHING
Highway
SIGNAL
This Flashing Signal Cuts Maintenance Costs
The ADLAKE Electric Flashing Highway Signal is built to operate for more than a year on one set of primary batteries, servicing and upkeep costs being practically eliminated.
No outside source of current is required. All working parts are self-contained. Economical first cost and installation combined with low maintenance cost, are big factors in ADLAKE popularity in cities, villages and on the highways.
Write for Descriptive Literature
The Adams & Westlake Company
CHICAGO
NEW YORK
PHILADELPHIA

consisting of a flasher similar to those used for many years in electric signs.

The vertical shaft of these signals is mounted on a cast steel ball which is held in place by oil-tempered equalizing springs and tension springs. When rocked, the steel ball turns on crucible steel bearing wheels, permitting quick return to its normal vertical position.

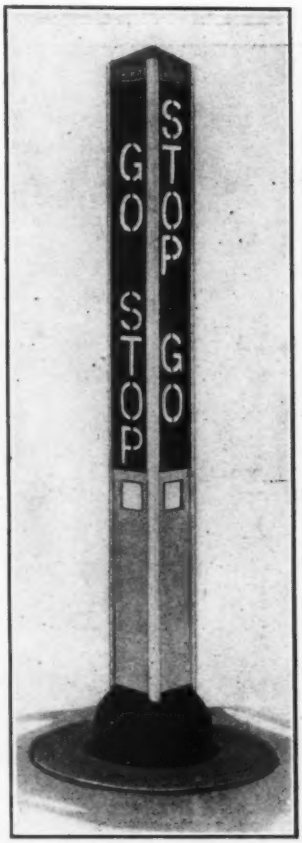
Fire Engine Manufacturers Change Name

The Prospect Manufacturing Company, Prospect, Ohio, well known as manufacturers of Deluge rotary fire pumps and motor apparatus for the last twelve years, has changed its name to the Prospect Fire Engine Company. This change brings the name of the company more in line with its work, as its efforts in the past years have been confined exclusively to the manufacture of fire apparatus.

There is no change in officers nor in the administration of the company, except in the name, which is felt to be more suitable to the business being conducted.

New Locked Cistern Top Real Life-Saver

The Yaeche locked cistern top is a Clark product of interest to a large group of municipal officials. This cistern top, made by the H. W. Clark Company, Mattoon, Ill., is most appreciated in localities where they have had many casualties through the use of loose, unlocked cistern, cesspool and vault covers. A great many children have lost their lives by falling into these holes when not fully protected. The Yaeche top has a special lock operated by a handle in the center which is protected by a cover when not in use. These covers insure clean cistern water because they cannot be meddled with, and are also excellent for coal holes in sidewalks. The cover has a 20-inch opening, measures 27 inches over all, and is well made, so that it will make a permanent installation.



THIS SIGNAL CAN'T BE KNOCKED DOWN

LOCKED COVERS PREVENT ACCIDENTS

New Motion Pictures About Sewers

What proper sanitation means to a community, and what salt-glazed clay pipe means in constructing sewers that will produce ideal sanitation, is to be put before the public by means of a motion picture. The Clay Products Association, 133 Chamber of Commerce Building, Chicago, Ill., through its Secretary, George C. D. Lenth, engaged the Atlas Educational Film Company, Oak Park, Ill., to make the picture, which will soon be released.

Thus salesmen for manufacturers in the Association will have two reels of film to exhibit in exploiting their product. One reel sets forth the properties of clay and the manufacture of salt-glazed clay pipe. The other explains the necessity for proper sanitation and the part salt-glazed clay pipe plays in the construction of adequate and indestructible sewers.

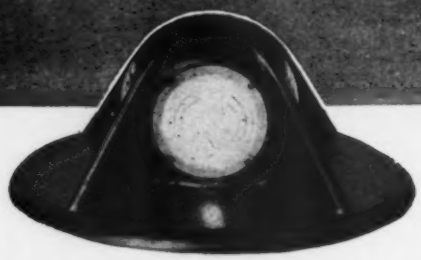
The reel having to do with sanitation is called "That Matter of Health." It explains that ancient Babylon and Nineveh decayed largely because of improper sanitation. Animated drawings show the contamination of wells by cesspools and sewer catch-basins, improperly constructed. Pestilence, the film shows, followed in the path of these conditions. That such situations still exist in various communities is then pointed out, with trick photography employed to show how outhouses and barns contaminate fresh-water wells.

How engineers solve these problems, the difference between storm, industrial and domestic sewers, and the necessity for constructing sewers to serve not only immediate needs but future demands, all follow in the next scenes. That salt-glazed clay pipe is unaffected by acids and alkalis in sewerage or in the soil is then emphasized with many illustrations. This point is further stressed by showing a chemist at work in a ceramic laboratory where he tests salt-glazed clay pipe with hydrochloric acid and finds that the glass surface of the pipe is not affected by the acid.

The second part is "The Romance of Clay," and shows the formation of the earth according to the spiral nebular theory, the creation of clay deposits, the indestructibility of clay and fineness of the particles, and the mining of clay.

How salt-glazed clay pipe is manufactured is then pictured, with the vitrifying process, within the kilns in detail. Various sizes of the finished pipe are shown,

Attention Compelling



Respect Compelling

Not a Device But a System

STREET traffic cannot be effectively controlled by "trick" devices, different in design and type on every corner. Like all other forms of traffic it should be directed by a coherent, logical system. Traficons provide such a system, a system so simple that a touring motorist can come into your city and drive about without violating traffic rules. The designers realized that no single device is equal to all conditions of traffic, so they created three simple units:

The Directing Traficon

(pictured above) to show traffic *where to go*, intended for intersections where the volume of traffic requires only a warning signal.

The Regulating Traficon

to show traffic *when* and *where* to go, intended for intersections, requiring the supervision of an officer.

The Zone Marker Traficon

to mark off safety islands, car boarding areas, parking zones and the like.

Each of these units is complete in itself, but the installation of all three types assures a definite and uniform system of control.

Booklet

Let us send you a 12-page booklet in colors, explaining and illustrating Traficons and Traffic Control.

TRAFICONS

Made by Traffic Control, Inc., Milwaukee, Wis.

A System for the Safe and Expeditious Handling of Traffic

LINE MATERIAL CO., South Milwaukee, Wis.

and its use in modern homes with proper sewer connections is contrasted with the conditions in those residences where proper sewer connections are lacking.

Hazard Moves Chicago Office

On May 1 the Chicago office of the Hazard Manufacturing Company, Wilkes-Barre, Pa., was moved to 32 South Clinton Street, Chicago, Ill. Prior to that time it was located at 552 West Adams Street, Chicago.

Two New Types of Traffic-Regulating Signals

After careful and exhaustive study of the various phases of the traffic problem and after long continued experimentation, the General Electric Company, Schenectady, N. Y., has developed two types of traffic-regulating signals. One is a flashing beacon which operates automatically and flashes on and off once per second. This unit is for use on secondary streets where it is desired to mark dangerous intersections or blind corners, on highways to give warning of the proximity of cross-roads or intersecting branch roads, at dangerous curves or grades, and at railroad crossings. The flashing beacon consists of a lighting unit installed on the top of a pipe rising from a concrete base to an over-all height of 8 feet 9 inches. The pipe is equipped with arrows or a box type sign on which may be printed any warning or direction desired. The lighting unit is a 23-watt, 110-volt clear Mazda lamp railroad type, mounted in a nest of silvered reflectors, so arranged as to give to the light the appearance of a vertical streak as it flashes on and off. It is enclosed in glass, making it water-proof. Through the glass at the bottom, light falls around the base of the standard, illuminating a circle several feet in diameter and making the signal clearly visible against the dark background. The unit is designed for operation both day and night. The flasher is operated by an alternating current motor which consumes 4 watts. With the lamp load this makes a yearly load of approximately 200 kilowatt-hours, if the unit is operated continuously on a 24-hour schedule. When installed at street or highway intersections, the unit can be tied into a 110-volt multiple circuit, or power can be taken from a series circuit by the use of an IL transformer. The latter arrangement is not, of course, feasible if the unit is to be operated by day as well as by night.

The other new unit, the Novalux automatic electric traffic signal tower for heavy traffic control, is intended for use at street intersections where travel is heavy both day and night. It is designed for automatic operation, but may be manually operated if desired, the changes being made in that case by the use of switches. The unit operates upon a multiple 110-120-volt circuit and a 24-hour schedule. The operating mechanism which, in this device as in the flashing beacon described, consists of a motor and mercury tubes, is contained in a weather-proof box at the base. The complete device is made up of two, three or seven lighting units on each of its four faces as desired, each complete in itself, but working in conjunction with the others. These units are mounted on a tower or post, the over-all height being approximately 15 feet. Each unit contains a single lamp in its center, the light from which is concentrated through the lens by means of the glass reflector.

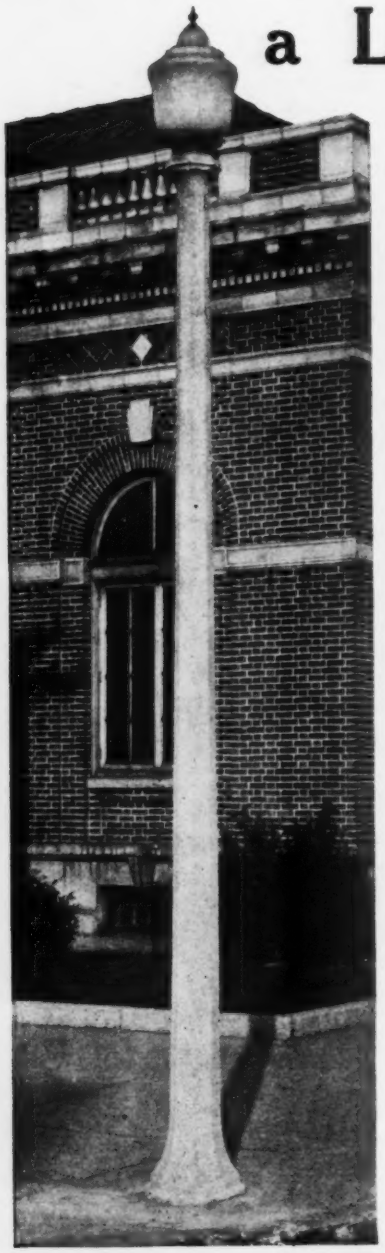
In the two-section combination, one section has four red and the other four green lamps, one on each face. Thus, when green, giving the right of way, shows up and down the street, red, stopping traffic, shows both ways in the cross-street. When the mechanism changes, the lights are reversed and the flow of traffic starts in the other diection.

The three-section combination adds a third section between the other two which shows amber on all four sides. This flashes on at any interval desired before the red and green are about to change, giving warning to drivers that the right of way is about to change, besides stopping traffic and providing a clear path for pedestrians.

The seven-unit type consists of four letters on each face with four sets of red lenses which spell out the word "Stop," reading from the top downward. The fifth section is the amber "Change" warning signal, and the sixth and seventh are green lenses with the letters "Go" on them and similar to the "Stop" of the upper four. Each letter in the four upper and two lower units is, as indicated, lighted by an indivadual lamp; and as wide-angle glass is used, the signs may be read at a great distance in brilliant sunlight and also at short range at a wide angle.

AN ELECTRIC FLASHING TRAFFIC SIGNAL WHICH ILLUMINATES THE PAVEMENT AND ALSO THE BASE OF THE SIGNAL

What is the Ideal Height for a Lighting Standard?



HOLLOWSPUN reinforced concrete lighting standards are made in a variety of sizes to meet any ordinary requirements. So we have no preference for any one size.

As independent observers, however, we cannot help noting the tendency toward increased mounting height. The installation pictured, at Chicago Heights, Illinois, uses a 15-ft. standard in a business and semi-business district having no high buildings. Some prefer the 12-ft. or 13-ft. height, but this is typical of the trend among lighting engineers and municipal authorities who formerly favored the 8-ft. or 10-ft. standards.

The principal arguments advanced by the advocates of these higher standards include:

1. A reduction in glare as the light source is raised.
2. Economy, as the spacing is increased, and the number of units correspondingly decreased.
3. Greater efficiency, as the higher candle power lamps used to get the same intensity with greater spacing are more rugged.

Our catalog supplement No. 9 has just been revised to show a large number of recent installations. The trend of current street lighting practice, as indicated in the new supplement, No. 17, will interest you. May we send you a copy?

Massey Concrete Products Corp.

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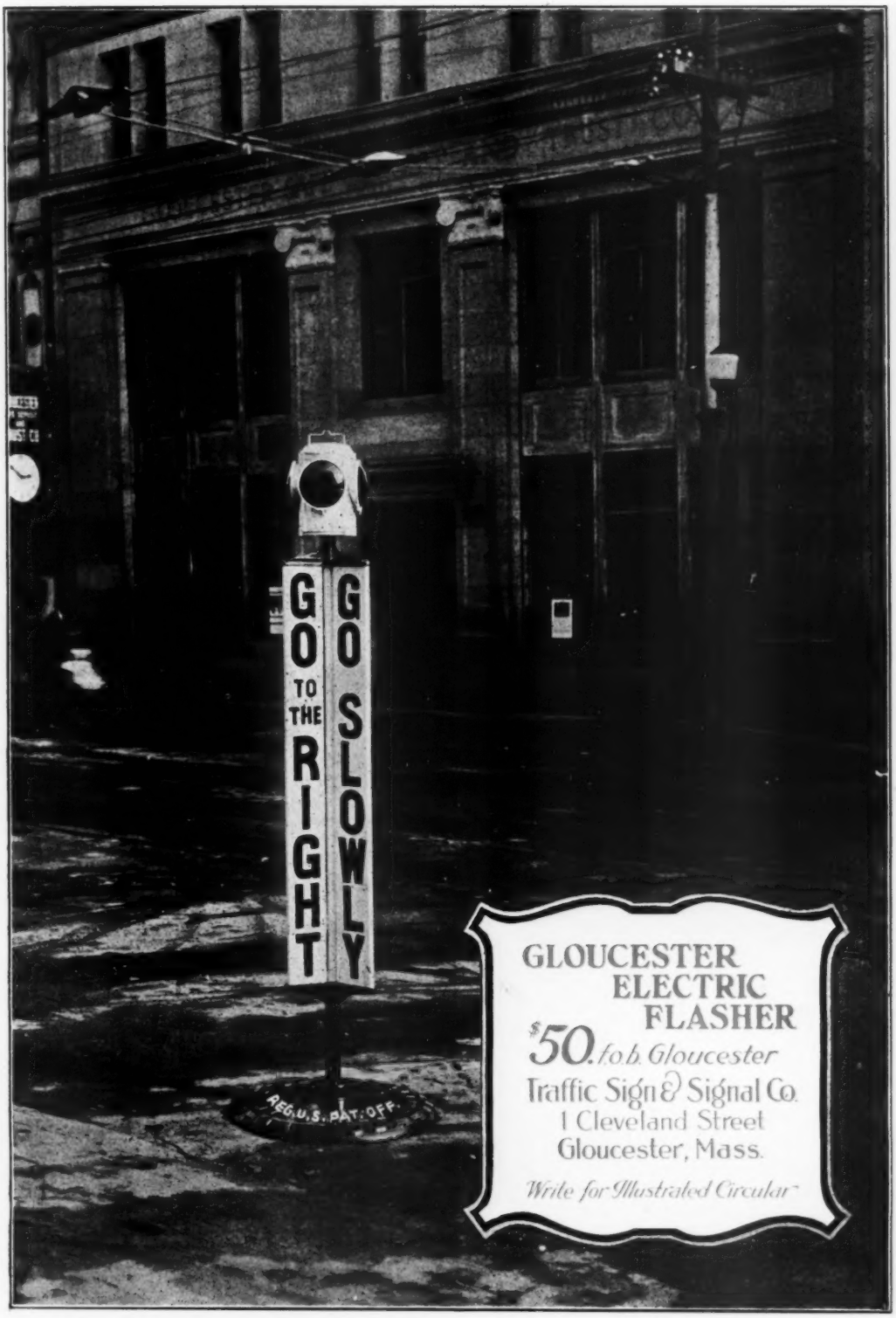
HOLLOWSPUN LIGHTING STANDARDS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GO SLOWLY
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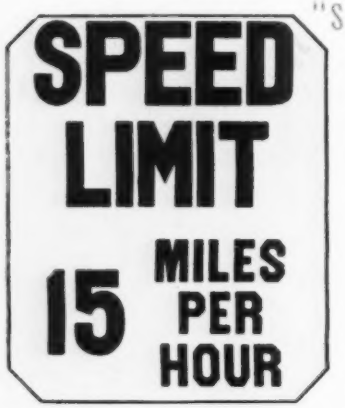

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SEMAPHORES
NO PARKING
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POST SIGN

Any Wording-Both Sides
Size 12 x 20
Price $1.50 each

THE IMPROVED
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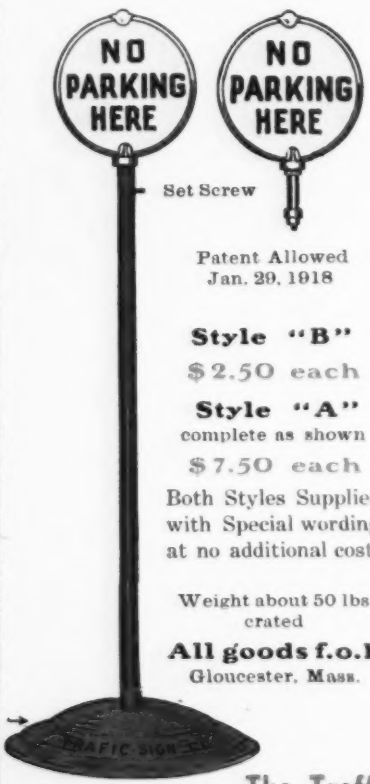
TRADE MARK

STYLE A STYLE B



Patent Allowed
Jan. 29, 1918

Style "B"
$2.50 each

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complete as shown
$7.50 each

Both Styles Supplied with Special wording at no additional cost.

Weight about 50 lbs. crated

All goods f.o.b
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Price $8.50 crated
Weight about 65 lbs.

This Price Includes Flag but not the Lantern

We furnish Lanterns with Red Globes $1.50 each

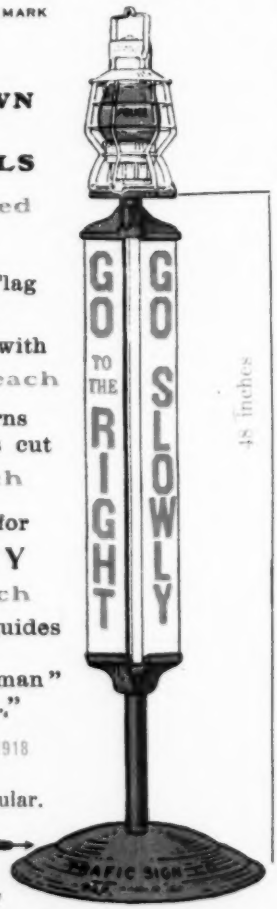
Special Police Lanterns such as shown on this cut
Price $2.50 each

With Lantern wired for
ELECTRICITY
Price $15.00 each

"As the channel Buoy guides the mariner
So the "Silent Policeman" guides the Motorist."

REG. IN U. S. PAT. OFF. JAN. 29, 1918

Write for a complete circular.



The Traffic Sign and Signal Co.,

1 Cleveland Street, GLOUCESTER, MASS.

AN EFFECTIVE TRAFFIC-CONTROL UNIT

The time interval between any changes of the automatic traffic tower signal may be regulated at will. "Stop" may be on for a minute, for example, succeeded by the "Change" signal for ten seconds, and "Go" for half a minute, or practically any combination desired may be effected by using different gear and settings on the mechanism. Each of the three types has a dome reflector for use with a 50-watt lamp mounted on the top of the tower, lighting the tower itself and the traffic officer if the latter happens to be stationed there.

An important feature of these units from the standpoint of successful operation and maintenance expense is the method by which the circuits are made and broken. This is accomplished by means of mercury in air-tight glass tubes, forming a switch which is operated by a synchronous motor. This switch will outlast even the unit itself, has no contacts to be burned or broken, and is highly efficient as compared with other switches, especiallly when a large amount of current is being used.

A Long-Burning Traffic Lamp

A traffic lantern which requires attention for filling or lighting only once a week. is manufactured by the Star Headlight and Lantern Company, Rochester, N. Y. This lantern, shown in the accompanying illustration, is equipped with four 5-inch ruby optical semaphore lenses or with two 5-inch ruby and two 5-inch green lenses, or other colors, if desired. The lantern may be used on movable or stationary stands and on silent policemen and flag stands for directing or signaling traffic, at crossroads, safety zones or at any other place where there is danger from automobile traffic. It is generally placed permanently at street intersections. This lamp uses a large kerosene oil font with railway signal long-time burner and has to be filled and lighted once a week only. This obviates entirely the trouble of collecting the old-fashioned tubular lanterns every morning, refilling them and returning them to their locations. The lamp is 16 inches high by 10 inches square and the base is 6 inches in diameter. The complete lamp weighs only 10 pounds. If desired, this lamp can also be equipped to burn electrically

The standard supporting the lamp shown below is made by the Traffic Sign and Signal Co., Gloucester, Mass.

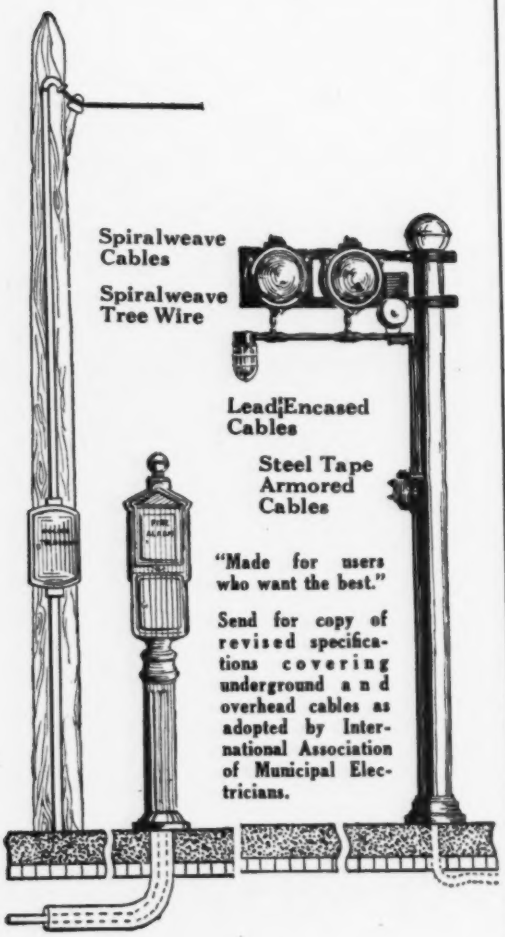
Dorr Receives Chicago Contract

The Dorr Company, engineers, 247 Park Avenue, New York City, have been awarded the contract to supply 30 Dorr sewage clarifiers, each 77 feet square, for the new activated sludge plant of the North Side Sanitary District of Chicago.

LONG-BURNING OIL LANTERN FOR SILENT POLICEMAN

Hazard
RUBBER INSULATED
WIRES & CABLES

For Municipal Signalling



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